S. Hrg. 101-1099, Pt. 2

DEPARTMENTS OF VETERANS AFFAIRS AND HOUSING AND URBAN DEVELOPMENT, AND INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1991

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

ON

H.R. 5158

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENTS OF VETERANS AFFAIRS AND HOUSING AND URBAN DEVELOPMENT, AND FOR SUNDRY INDEPENDENT AGENCIES, BOARDS, COMMISSIONS, CORPORATIONS, AND OFFICES FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1991, AND FOR OTHER PURPOSES

PART 2 (Pages 1–548)

Council on Environmental Quality
Department of Housing and Urban Development
National Aeronautics and Space Administration
National Science Foundation
Office of Science and Technology Policy

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DEPARTMENTS OF VETERANS AFFAIRS AND HOUSING AND URBAN DEVELOPMENT AND INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1991

TUESDAY, MARCH 29, 1990

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10 a.m., in room S-126, the Capitol, Hon. Barbara A. Mikulski (chairman) presiding.

Present: Senators Mikulski, Fowler, Garn, D'Amato, Grassley, and Kerrey.

NATIONAL SCIENCE FOUNDATION

STATEMENT OF ERICH BLOCH, DIRECTOR

INTRODUCTORY REMARKS OF SENATOR MIKULSKI

Senator **MIKULSKI**. This subcommittee will come to order. We meet today to consider the 1991 budget request for the National Science Foundation.

We welcome its Director, Mr. Erich Bloch, in his final official appearance before the subcommittee, since he'll be taking leave of this post at the end of the year.

We want to be sure that, though we might be saying eventually, so long, we're not saying goodbye. We want to commend you most sincerely for your hard work and dedication in your tenure as National Science Foundation Director and your response to the economic needs of this country.

BUDGET REQUEST

The Foundation is here asking for an additional $300 million above last year's level, which is an increase of 15 percent. This would bring the agency's total budget to just under $2.4 billion.

We are particularly delighted that this year's administration request recognizes the importance of science and math education by seeking a 23-percent increase over last year's appropriation in this area. The $251 million requested in this area is a significant step forward in reversing the decades of neglect in the areas of science and math education.

Last year, largely through the work of the subcommittee, the Science Foundation education budget went up 20 percent with a final program level of nearly $205 million.

I could go on. This is a long opening statement, which I'm going to ask unanimous consent that it be entered into the record. But I do believe that, in order to be ready for a 21st century economy, we need all of the science that we can have.

We look forward to hearing what you want the mission to be for the agency in fiscal year 1991. I know you'll be talking about research. I know you'll be talking about Antarctica. Of course, as you know, one of my own keen interests is expanding the pipeline from grade school to grad school in science and education.

We now have a farm team for the National Football League. Our colleges are often the farm team for the National Basketball Association. I want them to be the farm team for Nobel Prize winners.

So, having said that we'll be happy to hear your testimony. I want to see if my colleague, Senator Garn, has an opening statement.

Senator **GARN**. Thank you, Madam Chair.

Just very briefly, let me, first of all, welcome you here, Mr. Bloch, and your associates and say that I'm going to miss you. I certainly have enjoyed the opportunity the last several years of working with you and the National Science Foundation.

I don't think it's a secret to anyone that I have some considerable biases in the Senate, and they happen to be the National Science Foundation and NASA. I have not been able to hide that in my activities over the years. I agree with Senator Mikulski. I'm very pleased at the increases we've been able to get, and in the same areas she's talking about. I've given many speeches about the need for improved math and science education.

So this whole area, Function 250, space science and technology, I think, is so key to the future development of our country. We must not lose our technological base. So I congratulate you for the job you've done. You've got two Senators here that support the efforts of the National Science Foundation.

Thank you.

Senator **MIKULSKI**. Mr. Bloch, why don't you proceed with your testimony?

STATEMENT SUMMARIZED

Mr. **BLOCH**. Thank you, Madam Chair. Thank you and your colleagues for your comments. They're greatly appreciated.

I also want to thank this committee for its support for NSF over the years. NSF is just finishing its 40th year of operations, and we have come a long way.

This subcommittee, in particular, has played a big role in making NSF what it is today—namely, the preeminent Federal agency, outside the health sciences, supporting basic research and education in science and engineering. As the importance of new knowledge in the world economy continues to grow, so does the importance of NSF and its work.

The dramatic economic and political changes we have seen in the past year have changed the entire context for our efforts. The prospect of military confrontation has receded, but it has been replaced by the certainty of increased economic competition. These geopolitical changes reinforce other trends toward competition, including Europe in 1992 and the rise of competitors along the Pacific rim.

To cope with this competition, we need a stronger base of science and engineering. We are still the strongest country in the world, by far, in technical fields. We have the largest R&D effort, the most scientists and engineers, and the best higher education.

But the commanding lead we used to have is gone. For many years we focused much of our efforts on defense, with the result that Japan and West Germany now put more into civilian research relative to the size of their economies than we do. Industrial investment in R&D is not growing as rapidly as it should. Our universities suffer from obsolete facilities and instrumentation.

Most of all, our precollege education—and you alluded to that, Madam Chair—has been allowed to deteriorate to an alarming degree. Our schools are underfunded and our students do poorly in international comparisons.

SCIENCE AND ENGINEERING INDICATORS

It was in this context that earlier this year the National Science Board issues its biennial volume, Science and Engineering Indicators. It was accompanied by a statement that suggested priority areas for actions.

Namely, to recognize that most of the important research today is large scale, interdisciplinary and cooperative. Industry and universities have to get used to this.

Second, to improve education, especially precollege, but also at the higher levels.

Third, to train more scientists and engineers, especially minorities and women.

Fourth, to provide better support for university basic research.

Fifth, to develop better cooperation among industry, universities and government.

And, finally, to improve international cooperation in the basic sciences and engineering areas.

The National Science Foundation cannot solve these problems by itself. But our programs reflect these issues. You have details about it in your budget book and in my written statement.

GENERAL THEMES

In the interest of time, I would like to comment on the global issues and questions that underlie our budget request. I have a number of graphics that I would like to discuss with you which you have in front of you.

FIGURE 1

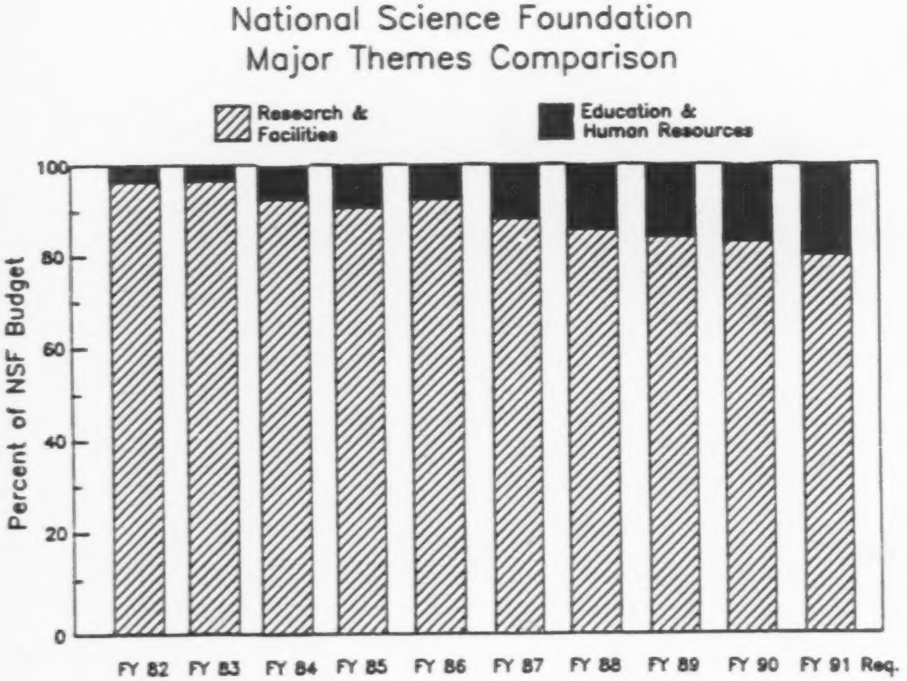
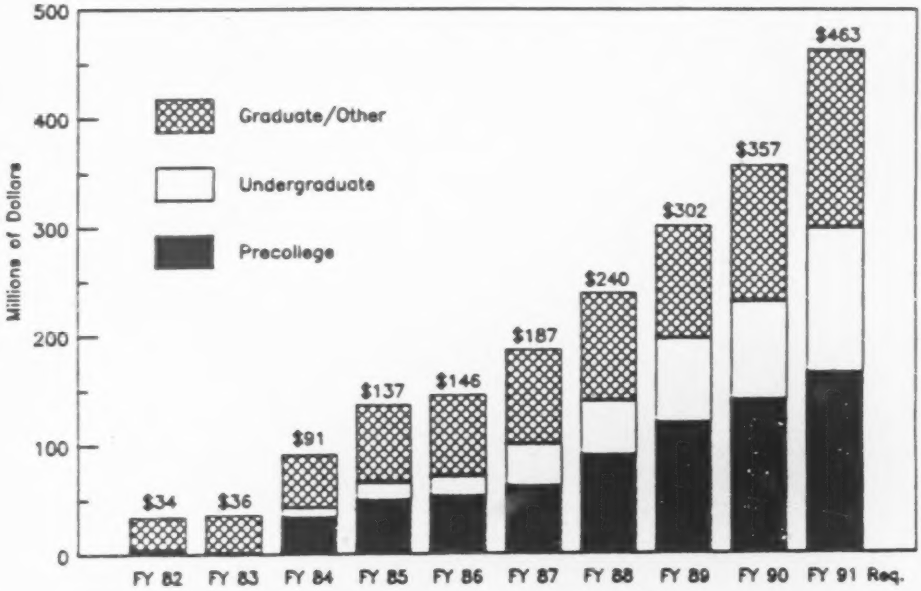


Figure 1 entitled "Major Themes Comparisons," focuses on the two areas that the National Science Foundation budget supports. First, education and human resources and, second, research and facilities. As you see on this chart, we have increased significantly, in percentage terms as well as in actual terms, the education and human resources area. In 1982, it was 3 percent of our total budget and that fraction is up in our 1991 request to 20 percent.

FIGURE 2

National Science Foundation
Education and Human Resources



The next chart (fig. 2), entitled "Education and Human Resources," needs a more detailed look. Graduate programs are up, as you can see on the blue line, because we need more scientists and engineers. Our programs are effective ways to increase the output of the pipeline. There's no other agency, Madam Chair, that provides more people support per dollar of R&D spending than the National Science Foundation.

The big growth is in undergraduate and precollege education. In the undergraduate area, it's up about 50 percent. About one-half of this is for teaching laboratories, with the rest for special programs for women, minorities, and disabled.

Last year we made over 600 awards in instrumentation and lab improvement, averaging about $32,000 each. Examples include many: Loyola College, from your own State, to teach automated design of VSLI circuits to computer science students and robotics to physics students, and to Marshall University to improve the undergraduate mathematics and computer laboratories.

The largest part of our education effort now, however, is in precollege, as you can see from this figure. We are investing heavily in this area because we believe this is where the biggest difference can be made. For many students, the precollege years provide the only exposure to science and mathematics. This is the point at which interest in scientific or engineering careers must be stimulated.

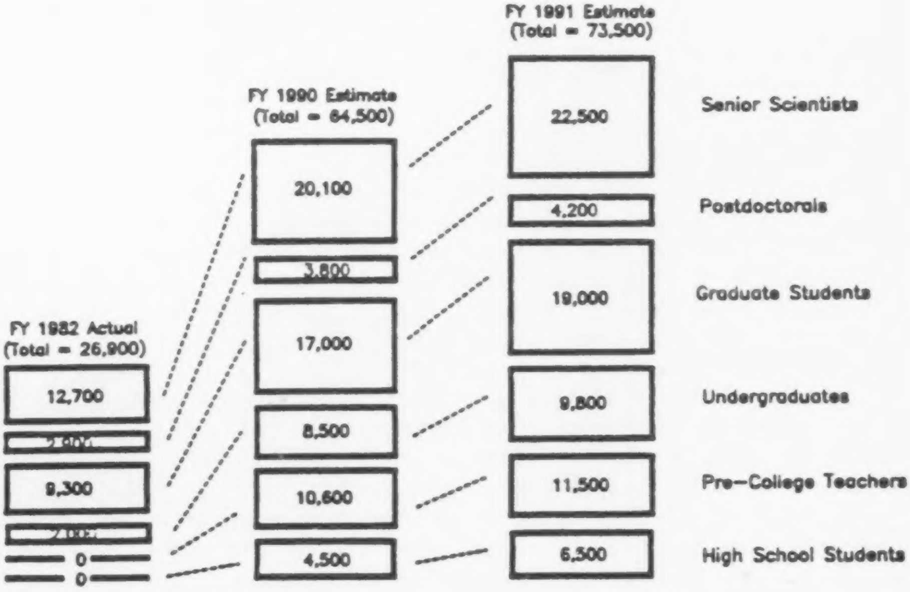
Last year, Madam Chair, you asked how university research helps to solve real social problems. In part, the answer is that basic research is the source of new ideas that drive economic growth. It's also that universities help provide an educated work force.

But often, there is also a link between a university and an improvement in the precollege education. For example, 30 junior high students will work with researchers at the University of Maryland at Baltimore this summer on projects in physics, biology, mathematics, and in chemistry.

In another project, Dr. Leon Lederman, the Nobel Prize winner, established Saturday Academies in Illinois to help both high school students and their teachers get more involved in science. He began this while he was the Director of the Fermi Lab, and has continued it at the University of Chicago. I could give you many more examples.

FIGURE 3

NATIONAL SCIENCE FOUNDATION
SUPPORT FOR HUMAN RESOURCES



The next, "Support for Human Resources," shows these programs are beginning to reach large numbers of people at each level of education. Our reach has increased a great deal since 1982. This responds to the need to provide better education for all of our young students, not just the ones who will go on to professional careers in science or engineering.

Senator MIKULSKI. Mr. Bloch, while you're going through, what does human resources mean?

Mr. **Bloch**. Support for human resources represents support for people—for students, for teachers, for undergraduates, for graduate students, for postdocs and for the senior scientists.

Senator **Mikulski**. Well, I want it for the record, because the word has no texture to it. It's so abstract.

EDUCATION AND HUMAN RESOURCES

Mr. **Bloch**. I probably should have said support for people.

Senator **Mikulski**. No; you're doing fine.

Mr. **Bloch**. Because that's what we meant.

Senator **Mikulski**. I see, and then these are the people that are involved in your programs.

Mr. **Bloch**. These are the people that are involved in our programs, in one way or another. Involvement reaches from high school students, all the way, as you would expect, to senior scientists.

More important, I think, is the comparison with 1991, to where we were in 1982, where there was zero participation for high school students, or precollege teachers. That shows the growth of these programs in those areas.

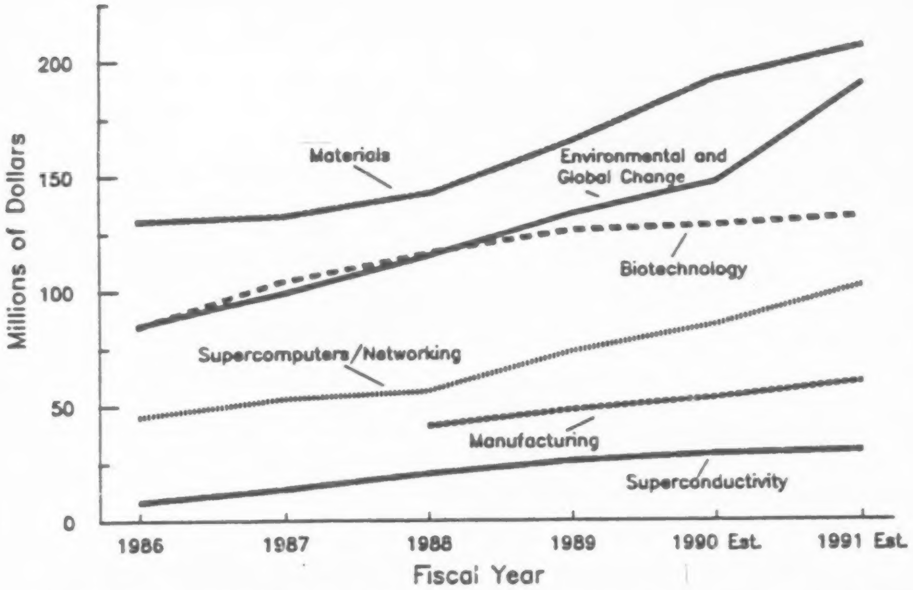
RESEARCH AND FACILITIES

Let me talk next about research and facilities, the second theme of our budget. It's the mainstay of the Foundation. The Foundation is the only Federal agency charged with supporting basic research in all disciplines across the board, except for the medical sciences. We support individual investigators and their graduate students and the major facilities they need, things like telescopes, computers, ships, et cetera. A substantial fraction of this support, over $300 million, in 1991 will go for laboratory instrumentation.

While this remains the largest part of our budget, the relative emphasis has dropped from 97 percent in 1982 to 80 percent today. This decline was necessary to make room for our increases in education and in support of people. But it is still a matter for concern because we must maintain a strong research base as a country.

FIGURE 4

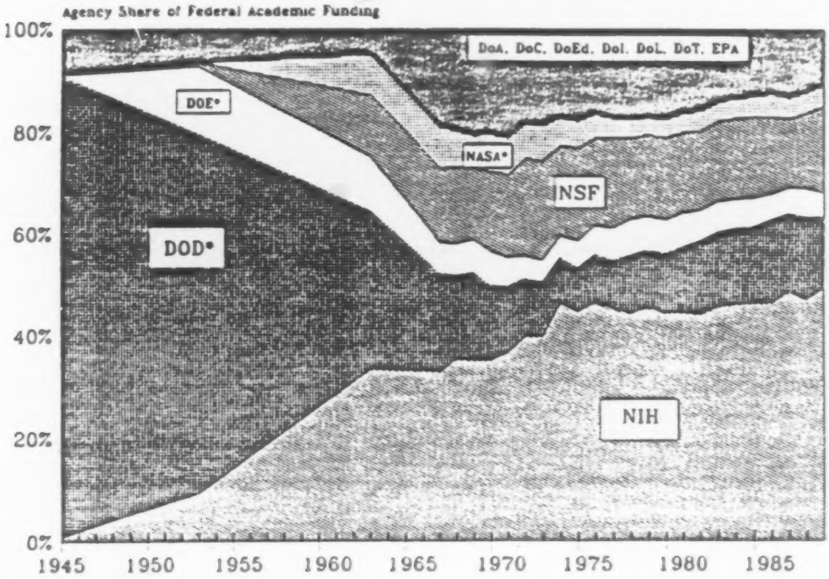
NATIONAL SCIENCE FOUNDATION INITIATIVES FOR ECONOMIC COMPETITIVENESS



There is an important connection between basic research in universities and our ability to compete in international markets. It is now well understood that basic research is a prerequisite to economic strength. In figure 4, I'm showing you a selection of many research areas that have a bearing on economic competitiveness.

FIGURE 5

Postwar Changes in the Influence of Federal Agencies on U.S. Academic Research and Development



* Including predecessor agencies
Sources 1945–52 U.S Congress 1963
1953–88 NSF Surveys

RESEARCH DEVELOPMENT AND ECONOMIC DEVELOPMENT

On the next figure, No. 5, labeled "Postwar Changes in the Influence of Federal Agencies," I want you to focus on a slightly different message about R&D and economic competitiveness. It's a message that should concern us.

The chart shows the long-term shift away from reliance on the Department of Defense, including the rise of NSF, and especially of NIH. It shows a major shift in disciplinary emphasis, between 1945 and about 1975, away from the physical sciences and engineering and toward the biomedical sciences.

The pattern in the United States is very different from other countries. We spend about half of our Federal support for academic research in the biomedical sciences, while the comparable figure for Japan and West Germany, is under 30 percent. One very positive result is that our pharmaceutical industry and the biotechnology sector benefit greatly from this support.

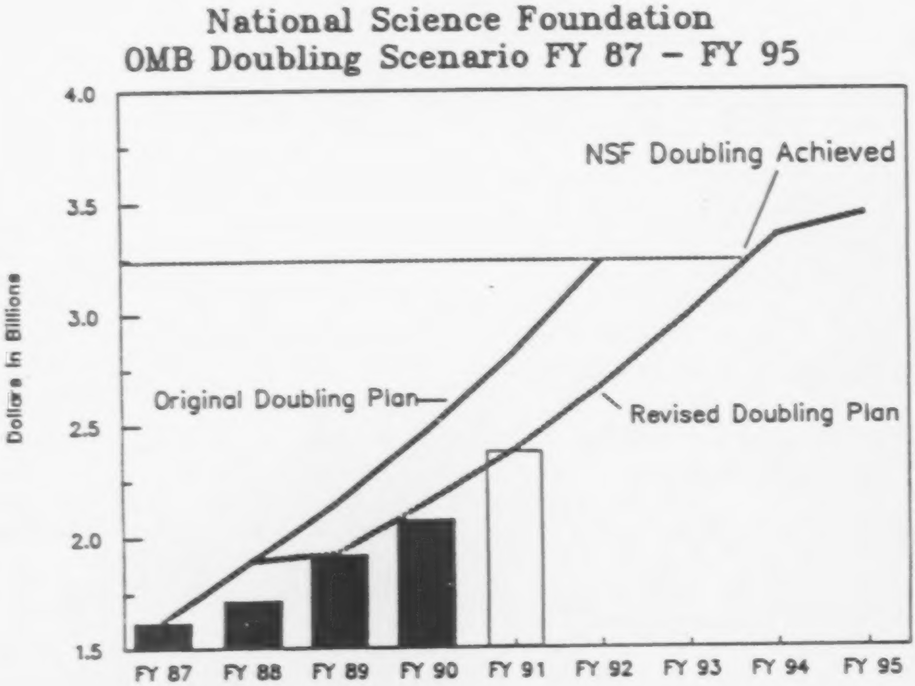
These observations suggest the economic importance of a strong basic research sector. Most of our industries depend more on the physical sciences and engineering than on life sciences. Virtually all the industries that have had difficulty with competitiveness, from semiconductors to automobiles, fall into this category.

There is also feedback from industry into education with respect to career choices. There has been a sharp falloff in 1987 and 1988 in the numbers of new bachelor's degrees in computer sciences, mathematics and engineering—the disciplines most directly related to industries that are in trouble economically. One reason is that students see that these industries may not be the best choice for careers. Research funding, competitiveness, and career choices are all related; each stimulates the others.

Another major difference between the United States and our competitors is the heavy burden of defense R&D that we carry. The President has already increased the relative emphasis on civilian R&D in the 1991 budget—39 percent from a low of 31 percent in 1986.

It's a very important move. Because our major competitors invest substantially more on civilian R&D, as a fraction of GNP, than we do. This committee has an opportunity, through support of NSF, to help remedy a competitive disadvantage that has been long in the making.

FIGURE 6



National Science Foundation
OMB Doubling Scenario FY 87 – FY 95

BUDGET HISTORY

This brings me to the matter of the recent history of the Foundation's budget (see fig. 6). After a long period of stagnation in the 1970's, a new period of significant growth began in 1982. It was underscored in 1987 when the administration committed itself to a doubling of the NSF budget over the ensuing years.

This doubling, which was stimulated by the importance of basic research to economic competitiveness, was reaffirmed when President Bush took office, and was emphasized recently by Dr. Bromley before this committee.

Despite this welcome emphasis on NSF, the growth in recent years has not come close to what is needed and recommended by the administration and by the authorization bill and committees of this Congress. Since 1982 the NSF budget has increased roughly 50 percent in real terms. We have made progress toward the 5-year doubling that the administration proposed, but have fallen short of the mark in each of the last several years.

That's really shown on this last figure (No. 6) that you have in front of you.

FEDERAL, STATE, AND INDUSTRY COOPERATION

I would like to conclude with a few remarks on a key problem facing the scientific and engineering community; namely, cooperation. A few days ago NSF announced a major new cooperative program called statewide initiatives in science education. The idea at NSF is to stimulate a comprehensive State plan to improve the entire educational system. We will work directly with selected States to improve teacher training and retention, curriculum, facilities, and equipment. It's an example of the sort of cooperation we need among State and Federal governments, between Federal agencies, and with industry. Another example of this cooperation is in the global change research area where the programs are being coordinated across the whole Federal Government.

Madam Chair, that concludes my remarks on the Foundation's program for 1991. Before I close, however, I have to make a special plea for the administrative budget on which we operate the Foundation—what we call PD&M.

PROGRAM DEVELOPMENT AND MANAGEMENT

When I came to NSF more than 5 years ago I immediately set out to reduce the funds spent on internal administration to the absolute minimum. From the high point of about 6.3 percent of total funds in 1982, PD&M in the 1991 request is down to about 4.3 percent. A major reason is that the Foundation's staff has been reduced to 1,195 persons, almost exactly the same as the 1,190 authorized in 1974, 15 years ago, despite the fact that the Foundation's budget has more than tripled and the number of proposals and grants has more than doubled since then.

We are very proud of our record of efficient, lean management. We have done it by using our resources carefully, by trimming away unnecessary procedures, and by extensive use of computers and related technologies.

We have gone as far as we can go in this direction. We have had to staff some areas below the efficient level, and we have cut travel and training below minimally effective levels. These are not frills or indicators of waste. They are absolutely necessary to the prudent management of public affairs. No well managed corporation would operate under the restricted conditions that we take for granted.

I know it's part of the game to ask for more than is required, because requests will always be reduced. I have refused to play this game, either with Congress or with OMB. Our PD&M request is not inflated. It's simply what we need to do our job.

In sum, NSF has a carefully constructed program for 1991 that responds to the major needs of the country for a stronger base in education, science, and technology. With your support, we will make progress in all of these important areas.

Thank you very much.

[The statement follows:]

STATEMENT OF ERICH BLOCH

Mr. Chairman and members of the subcommittee, I am pleased to present for discussion the National Science Foundation's budget request for fiscal year 1991.

As the Foundation enters its fifth decade, it finds itself in a very different research environment today compared to fifty or even twenty years ago. Then, research and education were critical for military security; now, they are vital to our economic competitiveness. Yet, despite these changes, the strength of our research system has been and continues to be our linking of research with education. We train our future researchers at the same time we generate new knowledge and transfer that knowledge to practical uses. Now, as then, NSF plays a vital role in supporting the education of a technical workforce and generating new knowledge. In fact, NSF, outside of medical sciences, plays a major role both in physical science and engineering research.

Our fiscal year 1991 budget request builds on the past strengths of our system, yet responds to current changes and challenges. It provides for $2.38 billion, an increase of 14 percent over fiscal year 1990, reaffirming the Administration's commitment to double the Foundation's budget, and reflecting a long-term commitment to significant growth in education and research in science and engineering. It reflects a strategic framework for a significant and balanced investment in education, the generation of new knowledge, and the transfer of knowledge from producers to users. It is an investment designed to nurture the close relationship between basic research and education in science and engineering and, in so doing, improve productivity and economic competitiveness.

CRITICAL ROLE OF EDUCATION AND RESEARCH

Knowledge has become a significant economic resource in a changing global economy. Our economic competitiveness increasingly depends upon the health of our research system which generates this knowledge. In turn, the health and vigor of our research system depends on our national investment in science and engineering education and research.

Education and research involve people and new knowledge. People generate knowledge; knowledge generates technological innovation; and technological innovation makes us competitive in a changing global economy and ensures our economic and technological leadership. This budget is an investment to ensure our economic and technological leadership. It is also an investment in our social well-being.

The opportunities for both investments to pay off are greater than ever. There are critical breakthroughs in such areas of robotics, information sciences, biotechnology; advanced materials, global change, genome research, and biodiversity. Much of this excitement is generated by state-of-the-art instrumentation and approaches to research which bring together individuals, groups, and institutions.

However, our national investments in education and research have been less than that of other countries. As a percent of GNP our spending on research has been relatively flat over a long time, and our investment in civilian R&D is less than 2 percent of GNP (Figures 1 & 2). Conversely, during this time, other countries have doubled and tripled their investments.

There is also a serious human resource shortfall developing. By the year 2000, the percentage increase in employment of scientists and engineers is projected to far outstrip the percentage increase of total jobs, which suggests very high demand (Figure 3). Yet, there are signs that the science and engineering educational pipeline is drying up:

By the year 2000, the number of college age people will be below the number in 1970 (Figure 4); and the fraction of science and engineering bachelor degrees going on for the Ph.D has been relatively flat.

And to compound matters, according to a recent national assessment of educational progress study, only 6 to 7 percent of high-school seniors are prepared for college-level science courses.

We are also facing a changing composition of our precollege student population. By the year 2020, minority students will be almost 50 percent of the total, up from about 25 percent in 1982 (Figure 5). Our workforce will be increasingly made up of women and minorities, now largely underrepresented in science and engineering fields. We must meet these challenges head on if we are to increase the number of scientists and engineers we educate and train, and we must improve math and science literacy to cope with an increasingly technological society.

FY 1991 BUDGET REQUEST

Our fiscal year 1991 budget request reflects the critical role research plays in our national economy. It responds to new opportunities within science as well as new challenges brought on by conditions in our culture and the world. It is a strategic program for generating new knowledge and supporting and developing human resources in a changing research environment and global economy.

Our request emphasizes two strategic themes (Figure 6):

Education and human resources—Developing human resources, broadening participation, and improving science and engineering education at all levels.

Research and facilities—Strengthening the research base and improving academic research equipment and facilities.

Research and Facilities is the mainstay of the Foundation, making up the largest fraction of our budget, but Education and Human Resources has become a significantly larger part since the early 1980's (Figure 7).

EDUCATION AND HUMAN RESOURCES

People are vital to the research infrastructure, and they are our first priority. They include not only the future science and engineering workforce pool, but also a scientifically literate public. In focusing on education and human resources, our strategy is to concentrate on critical points in the science and engineering educational pipeline and to broaden participation of underrepresented groups. The 1991 request includes over $463 million for education and human resources development, an increase of 30 percent, or $106 million, over fiscal year 1990. Of this total, $335 million is for education activities and $128 million for other human resource development activities.

Improving the quality of our science and engineering education and developing and broadening our human resources is reflected in the fact that support for education and human resources has grown from $34 million (about 3 percent of the NSF budget) in 1982 to $463 million (approximately 20 percent) in 1991 (Figure 8). More importantly, the number of people we support from high school students and precollege teachers to post-doctorals and senior scientists has grown from almost 27,000 in fiscal year 1982 to an estimate of 73,500 in fiscal year 1991 (Figure 9).

PRECOLLEGE PROGRAMS

Our precollege programs are the largest component of our education and human resources effort. In fiscal year 1991, we are requesting $165 million, up from $140 million in fiscal year 1990. We recognize that successful educational programs must be a cooperative effort, involving state and local government, industry, and the public. Our educational strategy at this level is to provide continued support for teacher preparation, instructional material development, and informal science education. This will be complemented by enhanced efforts in our States Initiative to forge strong federal-state partnerships to improve lower, middle, and high school science and mathematics education across the country.

UNDERGRADUATE PROGRAMS

Undergraduate education is another critical point in the educational pipeline. The quality of this educational level greatly affects a student's interest in pursuing a scientific career. The Foundation has developed a comprehensive range of undergraduate programs that, in fiscal year 1991, will increase by over $44 million or 48 percent to almost $134 million. These efforts involve programs throughout NSF and include support for student research; faculty enhancement; course and curriculum development; and instructional instrumentation and laboratory improvement.

GRADUATE PROGRAMS

Our graduate programs are crucial to increasing the output of the science and engineering pipeline. This is demonstrated in our support for 19,000 graduate students in fiscal year 1991, up from 17,000 in fiscal year 1990. Most of these students are supported on research project grants as research assistants; others are supported on graduate fellowships. New graduate fellowship offers will be increased to 1100 in fiscal year 1991, supporting nearly 2600 fellows during the year. This represents a doubling of graduate fellowships over the fiscal year 1987 level.

UNDERREPRESENTED GROUPS

Attracting undergraduates to a career in science and engineering by providing a quality education is not enough, however. Demographics not only show a shrinking pool of college age students to draw from, but also a shrinking pool that will increasingly be made up of women and minorities.

We also try to broaden the participation of underrepresented groups through programs designed to recruit and retain women and minority faculty and students as well as support a broad spectrum of institutions and regions. The Foundation's support for programs to broaden this participation of underrepresented groups has almost tripled since fiscal year 1987 (Figure 10).

The fiscal year 1991 Request provides $94 million for special programs for minority institutions and minority, women and disabled students and investigators, an almost 50 percent increase over fiscal year 1990. This effort involves not only distributed programs, such as Minority Research Initiation (MRI) and Research Opportunities for Women (ROW), but also targeted programs, such as Research Improvement in Minority Institutions (RIMI), Minority Research Centers of Excellence (MRCE), Research Careers for Minority Scholars (RCMS) and Visiting Professorships for Women (VPW) in the R&RA Account and Career Access Centers in the SEE Account.

Two new programs to assist underrepresented groups will be established in fiscal year 1991. Faculty Awards for Women will recognize and support outstanding faculty women in science and engineering. These awards will be given annually to 100 young women scientists and engineers nominated by their institutions. The Alliances for Minority Participation program will encourage undergraduate minority students to complete their baccalaureate degrees and pursue graduate studies in science and engineering. Projects will address problems such as retention, support, and inadequate student preparation, and will emphasize comprehensive approaches to these problems with strong local involvement in project design. Both of these programs are decade-long programs, not just short term efforts soon to be replaced by others.

RESEARCH AND FACILITIES

The primary focus of NSF support continues to be university-based basic research and capacity-building. Support for university-based research and facilities in fiscal year 1991 is $1.81 billion, an increase of 11 percent ($183 million) over last year. As part of our strategy of a balanced investment, it provides for individuals and groups of investigators, laboratory instrumentation, and access to large centers and facilities, computers, and computer networks.

Our research goals have always been and continue to be the support of people and the generation of new knowledge. And in the present research climate, we seek a balanced portfolio to maximize our investments in academic research. This portfolio must meet existing needs, respond to new challenges, focus on key areas where NSF can make a difference, and leverage national resources.

The individual investigator continues to be the cornerstone of the basic research system in this country. In fiscal year 1991, support for small-scale science, which includes individual investigators and small groups of investigators, is 70 percent of our research and related budget. This form of support is a major source of small-scale research instrumentation as well as the focal point of graduate research training.

But NSF also continues to support research organizations that stimulate the transfer of knowledge and promote cooperation among individual researchers, and that attack disciplinary and complex issues that are beyond the capability of an individual or a group. Eight percent of the fiscal year 1991 request goes to support centers. In this form of support, investigators solve problems on the boundaries of disciplines and provide a forum for knowledge transfer through the training and educating of our future scientists and engineers. Already the first class of Science and Technology Centers (STCs) are showing a positive impact in these areas. A second class of 10-12 STCs, deferred from 1990 due to a constrained Research and Related Activities budget, will be awarded in fiscal year 1991. Our ERC's are approaching a steady state number and no new ones are planned for fiscal year 1991.

The research we support must respond to current issues and opportunities. Accordingly, this budget devotes increasing resources to the global change initiative, genome projects, biodiversity, materials research, arctic research, high performance computing, (which provides state-of-the-art networking for researchers and educational institutions of all sizes), manufacturing research, and software engineering research. As a major part of this effort:

NSF will roughly double, to $103 million, its support of the President's U.S. Global Change Research Program that seeks to understand, and ultimately, to predict future changes in the earth's environment, such as global warming (Figure 11).

Support for the genome project, the effort to map and sequence a plant genome, will not only support basic research, but also instrumentation and equipment, providing training necessary to carry out more extensive genome projects.

A special research thrust on the processing and synthesis of advanced materials, including polymers, superconductors, microstructures, composites, and biomaterials.

Although NSF plays a small role in the total federal R&D effort (about 3 percent), in some education and research areas important to our future social well-being and economic competitiveness, NSF plays a much larger role. For example, we support 37 percent of federal research in high performance computing; 20 percent in land-based global change research; and 10 percent in robotics, semiconductors, and superconductivity. In science and engineering education, we make up 45 percent of the federal effort (Figure 12).

Our support for many of these research initiatives has been a conscious investment for our future competitiveness (Figure 13). We believe they are likely to prove economically important in the next decade or so. Some of the investment has been through large grants to centers and groups of investigators, but much more has been through grants to individual investigators who believe that these fields promise important breakthroughs to new knowledge.

EQUIPMENT AND FACILITIES

Quality research needs a viable infrastructure of large-scale equipment and facilities. The request includes continued support for maintaining and upgrading four National Supercomputer Centers, expanding and improving services provided by NSFNET, and building major new equipment.

Our request for major equipment in physics and astronomy reflects the need for international cooperation and joint activities in order to leverage our resources and foster shared use of expensive equipment. Because of escalating equipment costs, there is a greater need for joint participation with other agencies and other nations. Three major equipment initiatives maintain our preeminence in gravitational physics and ground-based astronomy, and, at the same time leverage considerable international and interagency support. They are:

Construction of two identical, but widely separated, next-generation gravitational wave detectors in fiscal year 1991 at a total estimated cost of $192 million over four years. Two European groups are planning to build similar detectors, which will, working in concert with the NSF-built facility, permit systematic astrophysical observations in the new field of gravitational wave astronomy.

Construction of two 8-meter optical-infrared telescopes, one in each hemisphere, and jointly funded by the U.S., the United Kingdom, Canada, and other countries as prospective partners. Design and initial purchase of glass for mirrors will take place in fiscal year 1991.

Upgrade of the 305-meter reflector at the Arecibo Observatory in Puerto Rico. Costs totaling $22 million will be shared equally by NSF and NASA.

Academic research laboratories and facilities are an integral part of quality research and training. Recent surveys and assessments indicate that they have deteriorated and there is a need to repair, renovate, and modernize them as well as provide new construction. Our request of $20 million for modernizing academic research equipment responds to this need and continues this committee's initiative of last year. Together with the fiscal year 1990 funding, this activity provides almost $40 million for awards made as a result of the first competition.

INSTRUMENTATION

Advanced instrumentation and computational power enhances individual research efforts and provides investigators with the tools required to accelerate the pace of scientific discovery. The development of important new methodology, of computer software, and of equipment that will increase the accuracy, range or sensitivity of research observations, is critical to major scientific advancement. Examples of support include:

Collaborative efforts in the development of techniques and instrumentation for optical microscopy; development of instrumentation, including computer software, required for contemporary work in science and engineering; and marine and terrestrial field stations refurbishment.

While key to furthering the research enterprise, high-quality instrumentation is critical for training the nation's future scientists and engineers. NSF's Instrumentation and Laboratory Improvement (ILI) program focuses on strengthening the undergraduate laboratory experience at all types of academic institutions. The ILI program is to be funded at a level of $23 million in fiscal year 1991.

While the cost of research equipment has increased at a faster rate than inflation, NSF funding has remained flat over the past few years. This has resulted in growing pressure on operations of existing research equipment and deferral of much-needed acquisitions. The fiscal year 1991 Request continues the increased pace begun in fiscal year 1990 to address this shortfall with increased funding for scientific instrumentation through both individual research grants and special NSF division-level programs. In fiscal year 1991, an estimated $307 million will provide funding for instrumentation and major equipment, an increase of $73 million, or 31 percent, over fiscal year 1987 (Figure 14).

SAFETY, HEALTH, AND THE ENVIRONMENT IN THE ANTARCTIC

We also continue our major commitment to safety, health, and environmental concerns in the Antarctic. Of the $23.3 million increase in the U.S. Antarctic Program (USAP), $17 million goes toward the safety, environment and health initiative begun in fiscal year 1990. Efforts will concentrate on waste disposal, facilities improvements at South Pole Station, improvements in search and rescue communications, and upgrades in air traffic control and precision landing systems.

PROGRAM DEVELOPMENT AND MANAGEMENT

We are requesting a $6.12 million increase (6.3 percent) over fiscal year 1990 for Program Development and Management (PD&M). This represents only 4.3 percent of the total NSF budget, supporting an FTE level that is still below the staffing levels of ten years ago, yet handling more than twice as many proposals today. The majority of the requested increase is needed to fund known pay raises and other cost increases associated with the current levels of staff and services, and provide for 30 additional FTE. We have taken effective measures to control the growth of administrative costs in order to maximize the resources available for scientific research. This request represents the minimum level needed to maintain effective administration of NSF programs, and should be fully funded.

SUMMARY

The National Science Foundation has proposed a $2.386 billion budget for fiscal year 1991, an increase of $300 million over fiscal year 1990. It is the cornerstone of the Administration's $4.66 billion requested increase in Federal R&D because it underpins all other R&D sectors, public and private (Figure 15). It provides the funds to train the people who are needed to carry out the human genome project, build the space station, and devise and implement a space mission to Mars; and it generates the needed knowledge-base across all fields of science and engineering. It is a small, but necessary investment in the nation's future economic growth and security.

There has been a major disciplinary emphasis between 1945 and about 1975 away from physical sciences and engineering (as represented in DOD and NSF funding of academic research) and towards the life sciences, as represented by NIH's increasing share of federal funding of academic research (Figure 16). Yet, virtually all the industries that have had difficulty with competitiveness—from semiconductors to automobiles—depend more on physical sciences and engineering than on life sciences. The problem would even be worse if DOD support of academic science and engineering were reduced without commensurate increases in physical sciences and engineering research in civilian agencies such as NSF.

The President has already increased the relative emphasis on civilian R&D in the fiscal year 1991 budget—to 39 percent, up from a low of 131 percent in 1986. This is a very constructive move, because our major competitors invest substantially more, as a fraction of GNP, on civilian oriented R&D than we do. This committee has an opportunity, by supporting NSF, to help remedy a competitive disadvantage that has been long in the making.

The budget history of the Foundation, in constant dollars, has been uneven. Growth after 1956 depended on the perception of national need that followed Sputnik. In the same way, growth today rests on the belief that the nation needs a stronger science and technology base. This has been dramatically emphasized by the commitments of both President Reagan and President Bush to double the NSF budget over five years, and most recently in Dr. Bromley's statement to the House Science Committee a few weeks ago.

Despite emphasis on NSF, growth in recent years has not come close to what is needed and recommended by the Administration. Since 1982, the NSF budget has increased about 50 percent in real terms. We have made progress toward the five-year doubling that the Administration proposed, but have fallen short of the mark in the last several years (Figure 17).

We need to do better than that, and I urge you to make this the year in which we begin.

R&D Expenditures as a Percent of GNP
For Selected Countries

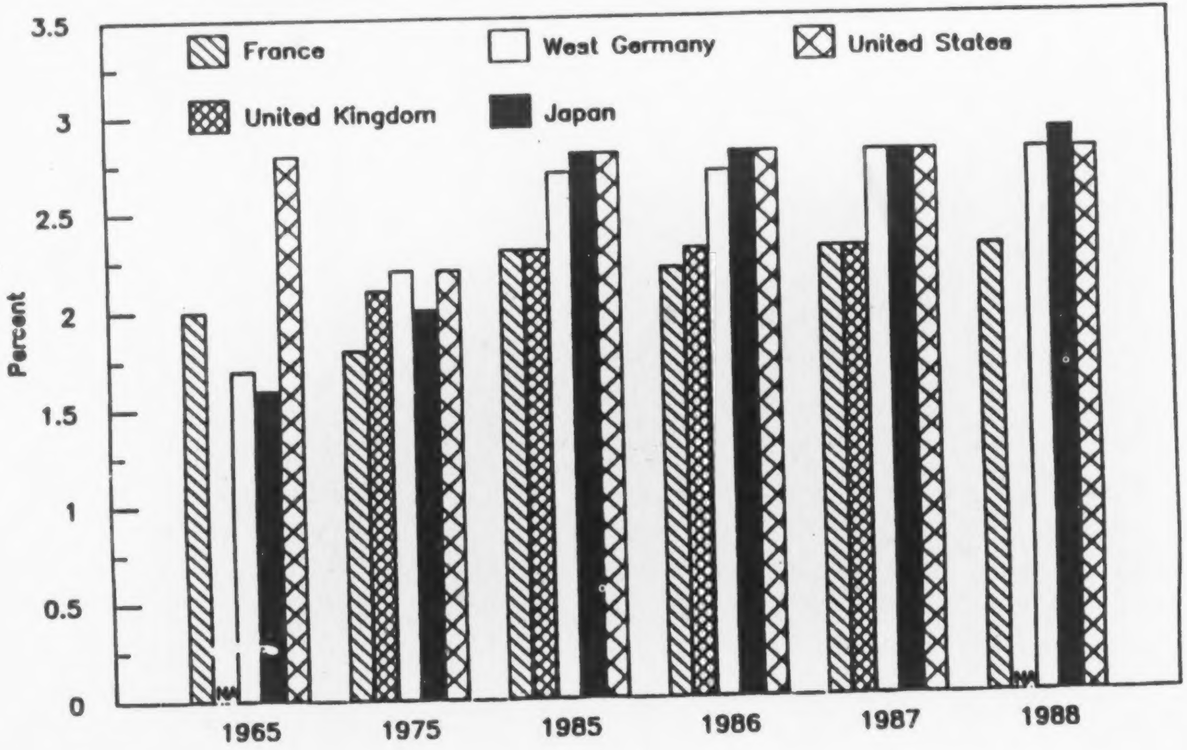
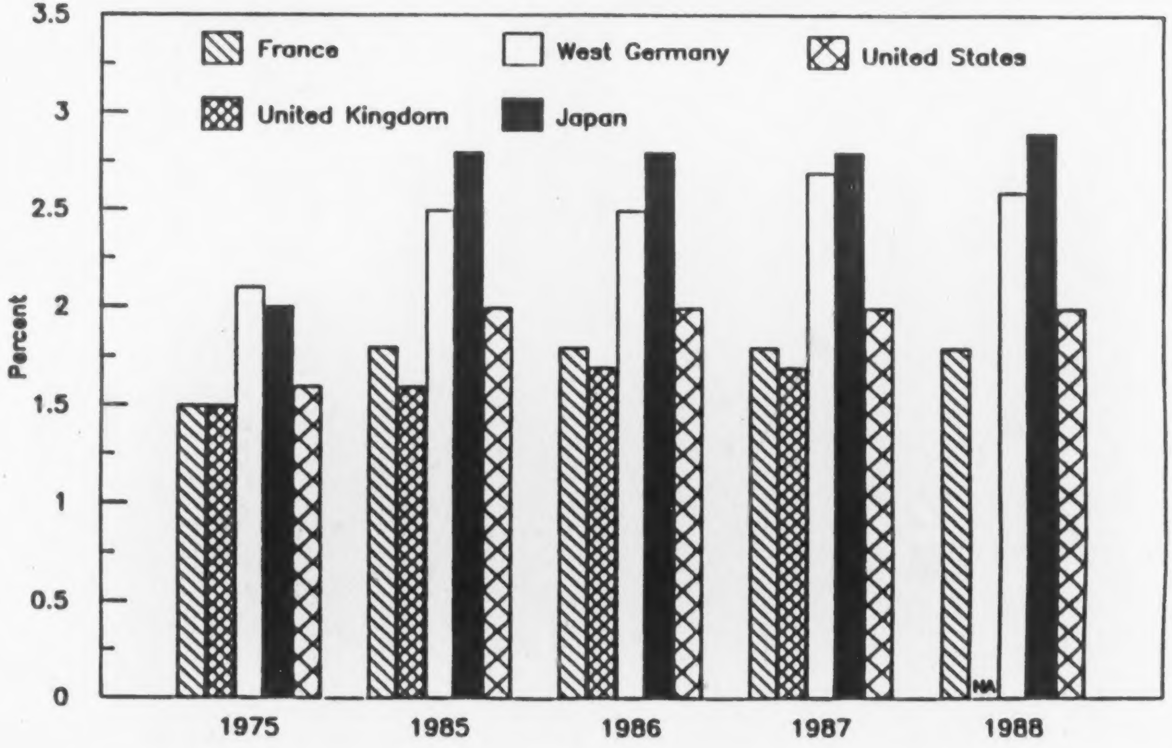


Fig. 1



Non-Defense R&D Expenditures
As a Percent of GNP For Selected Countries

Fig. 2

Projected increase in science, engineering and total jobs in private industry: 1988-2000

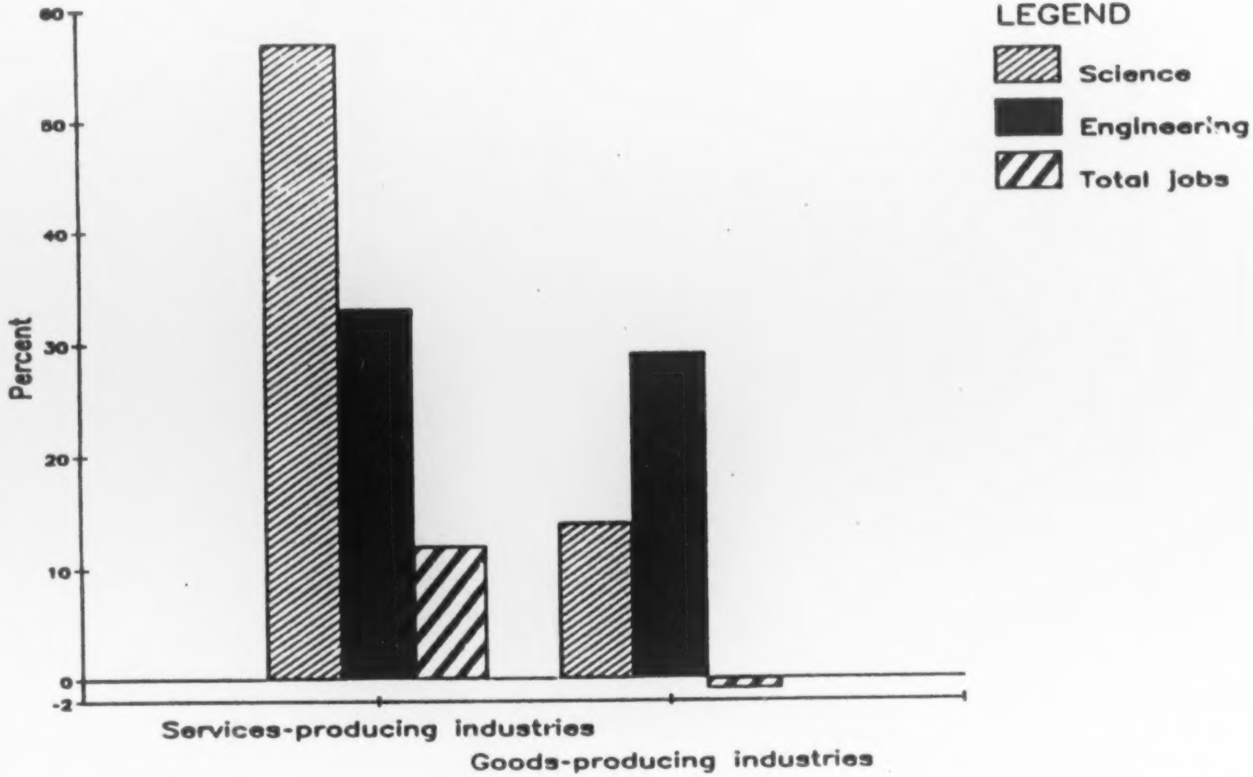


Fig. 3

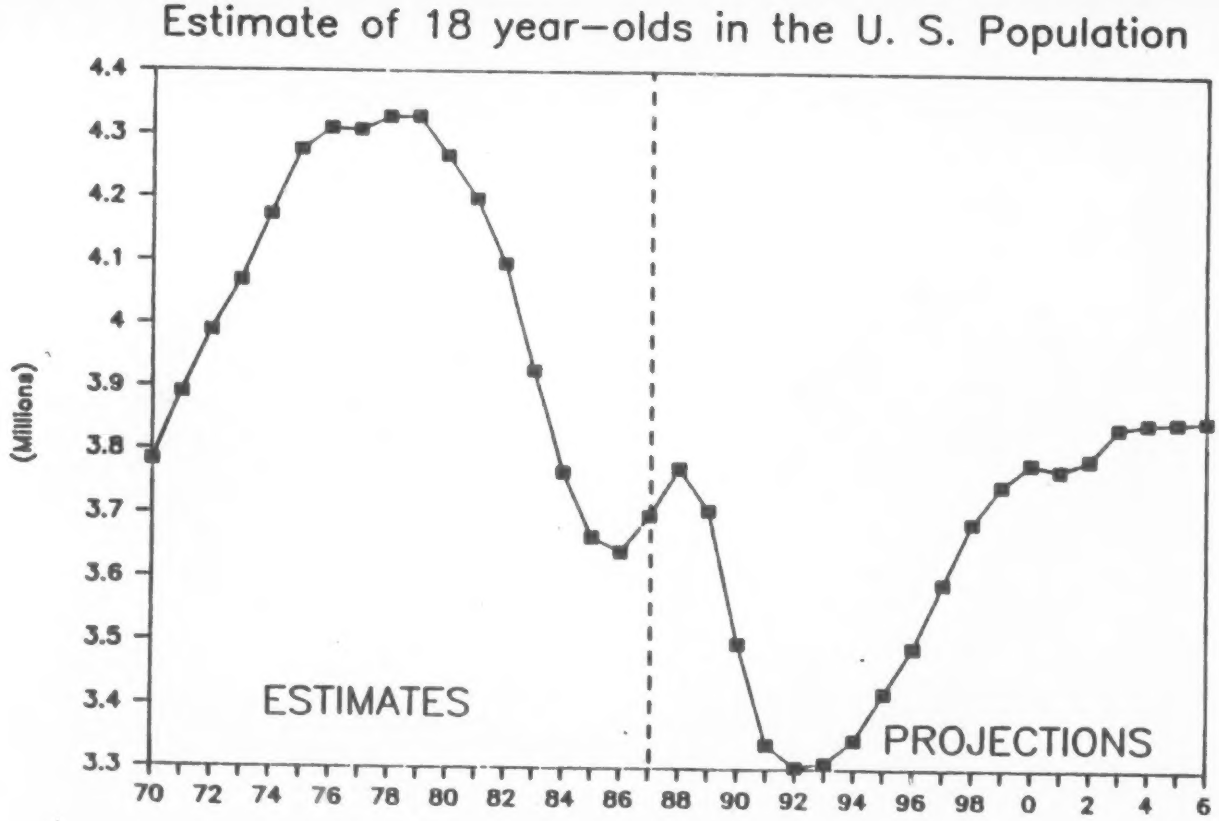

Estimate of 18 year-olds in the U. S. Population
(Millions)
4.4
4.3
4.2
4.1
4
3.9
3.8
3.7
3.6
3.5
3.4
3.3
ESTIMATES
PROJECTIONS
70
72
74
76
78
80
82
84
86
88
90
92
94
96
98
0
2
4
6

Fig. 4

Distribution of Students
Age 5-17 Years Old

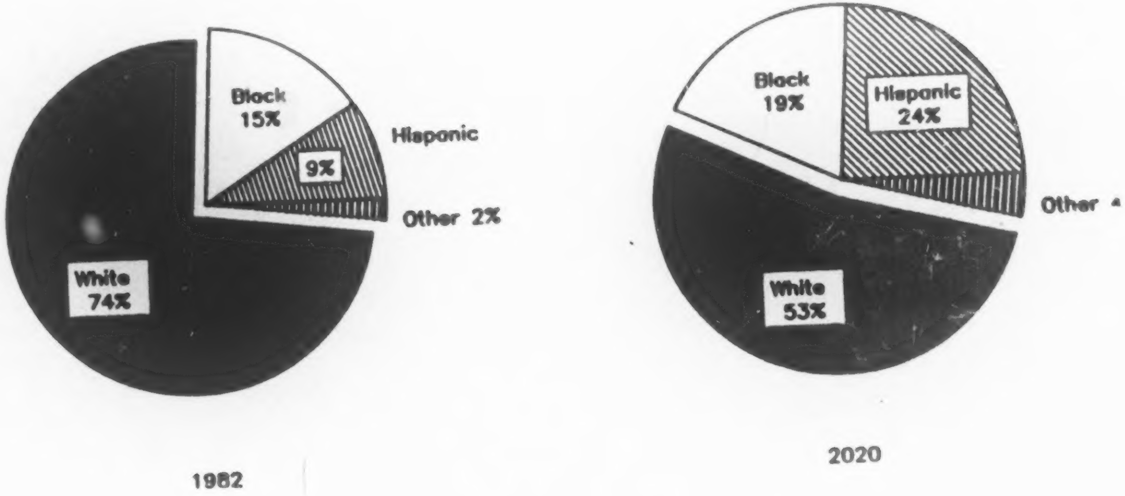


Fig. 5

NATIONAL SCIENCE FOUNDATION
BUDGET THEMES
FY 1990 - FY 1991
(Millions of Dollars)

	FY 90	FY 91	Change	
	Plan	Request	Amount	%
Education & Human Resources	$357	$463	$106	30%
Research & Facilities	1627	1809	182	11%

Fig. 6

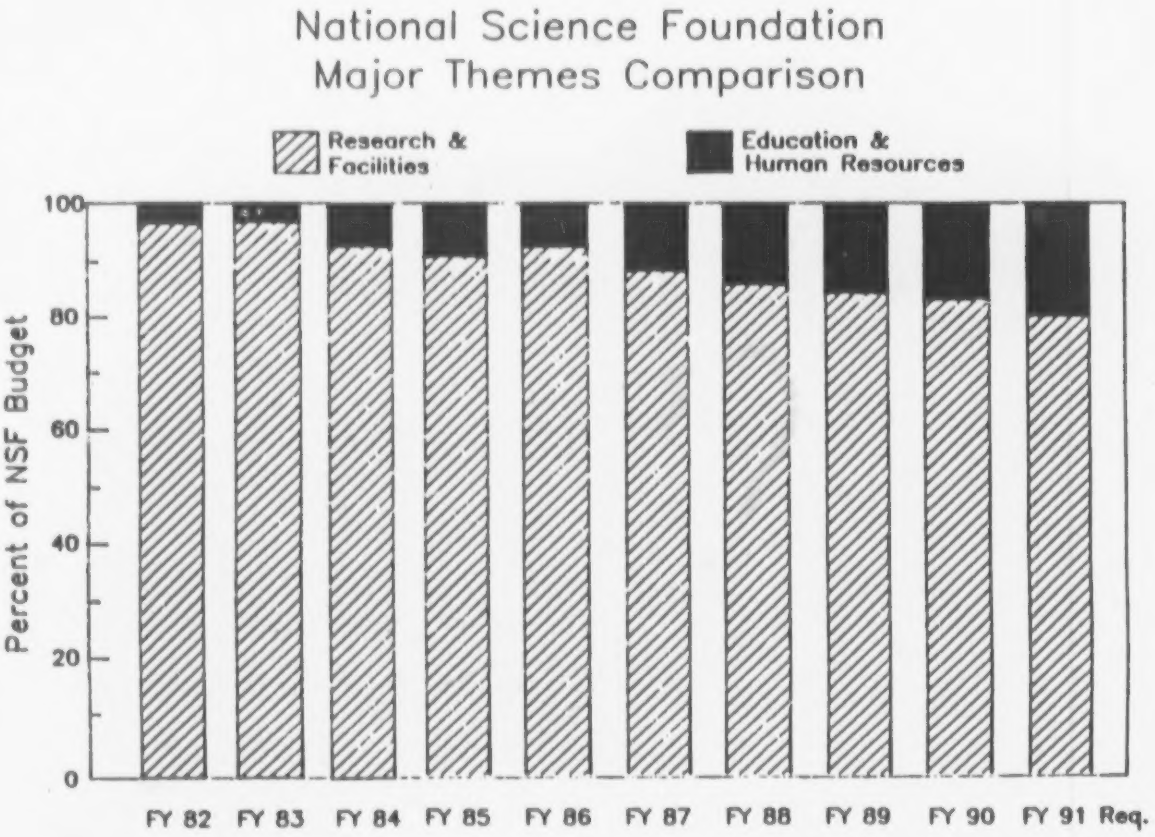

National Science Foundation
Major Themes Comparison
Research & Facilities
Education & Human Resources
Percent of NSF Budget
100
80
60
40
20
0
FY 82
FY 83
FY 84
FY 85
FY 86
FY 87
FY 88
FY 89
FY 90
FY 91 Req.

Fig. 7

National Science Foundation
Education and Human Resources

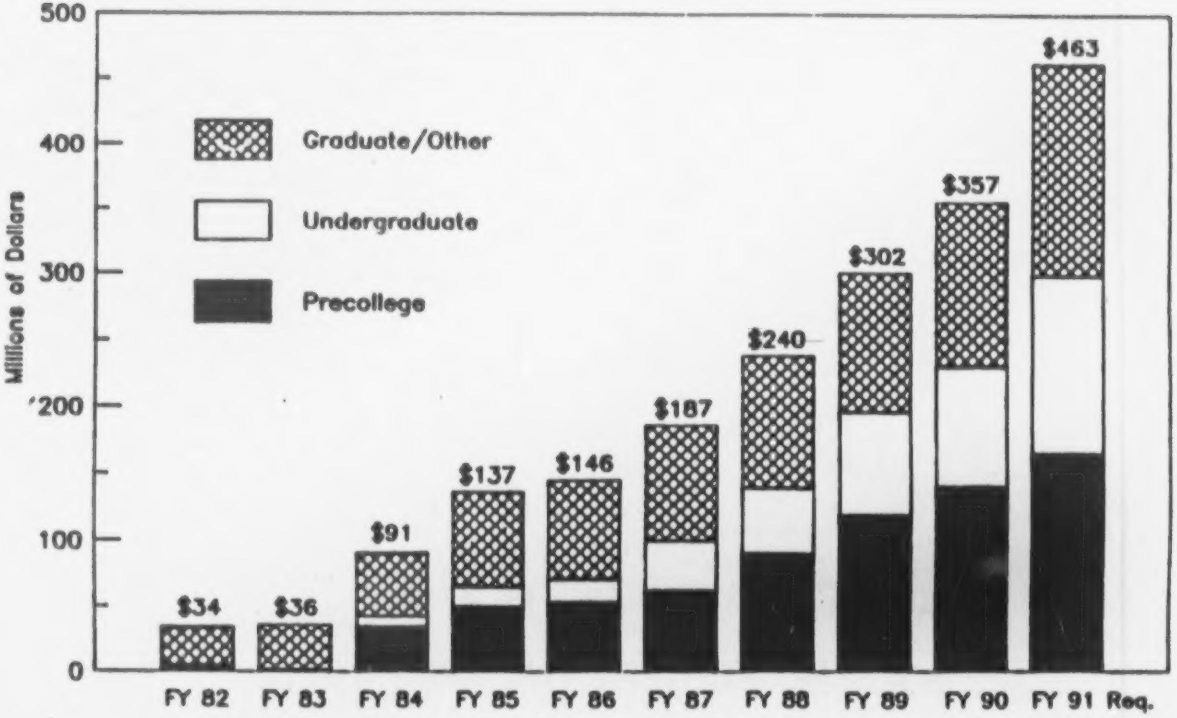


Fig. A

NATIONAL SCIENCE FOUNDATION
SUPPORT FOR HUMAN RESOURCES

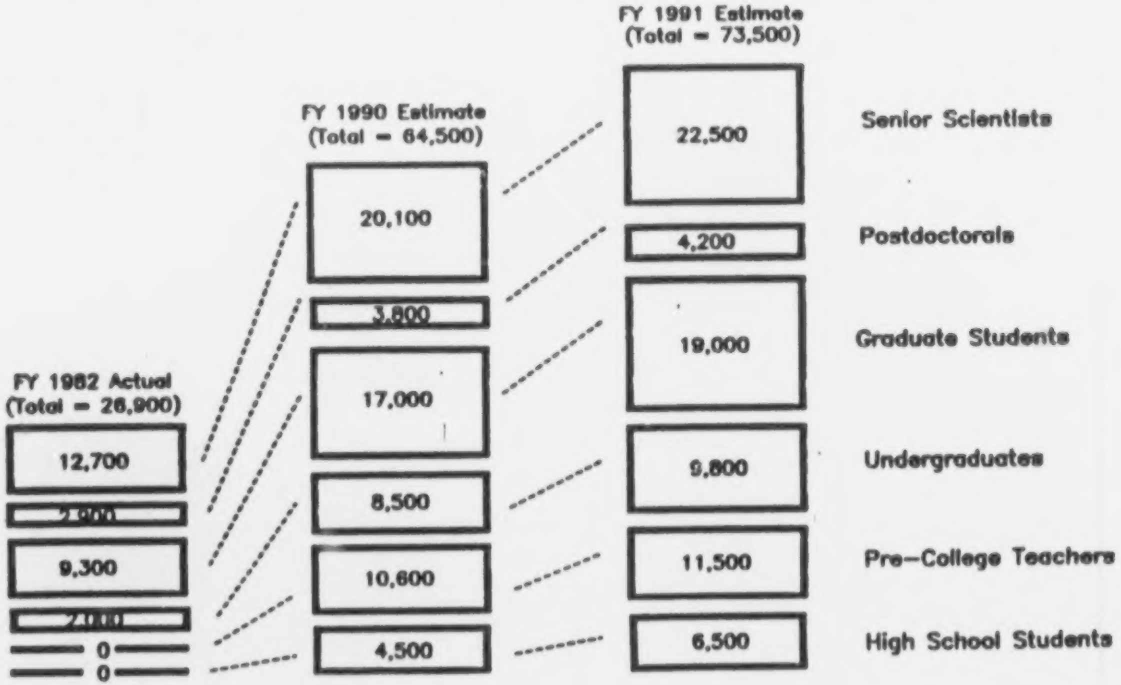


Fig. 9

1-10-

PROGRAMS TO BROADEN PARTICIPATION

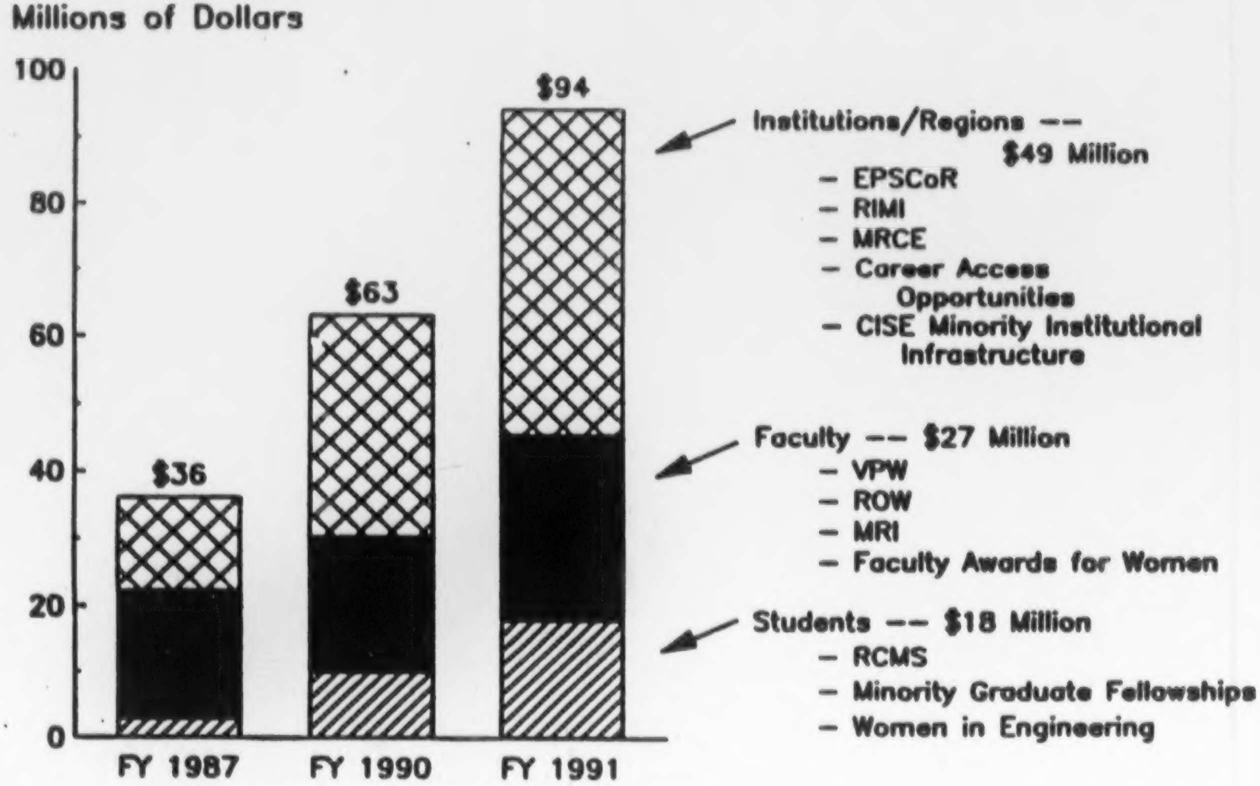


Fig. 10

NATIONAL SCIENCE FOUNDATION
GLOBAL CHANGE RESEARCH

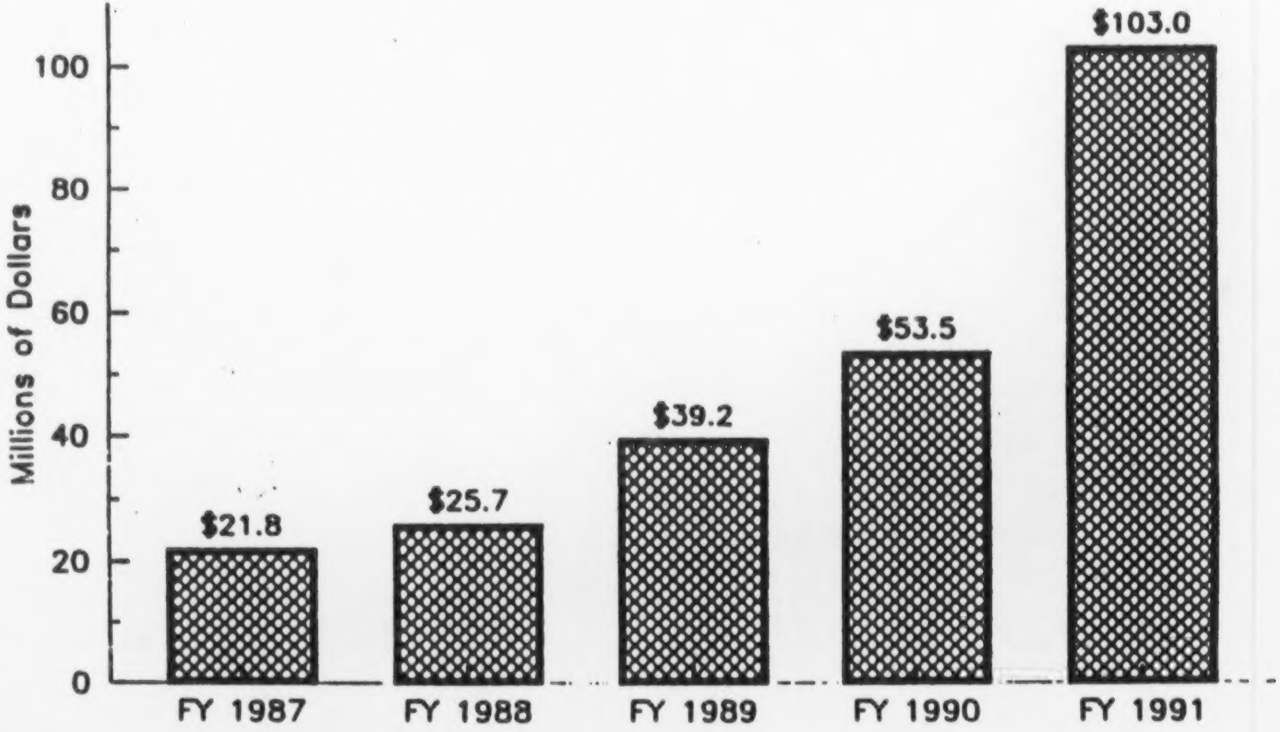


Fig. 11

NSF Share of Federal Support
FY 1991 Request

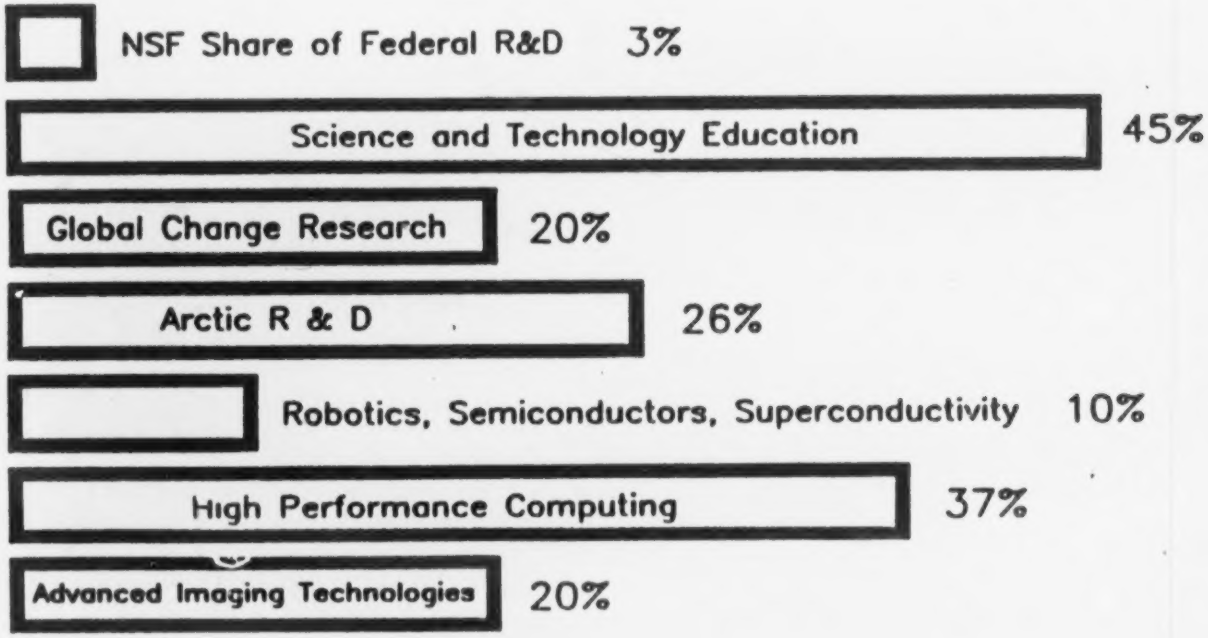


Fig. 12

NATIONAL SCIENCE FOUNDATION
INITIATIVES FOR ECONOMIC COMPETITIVENESS

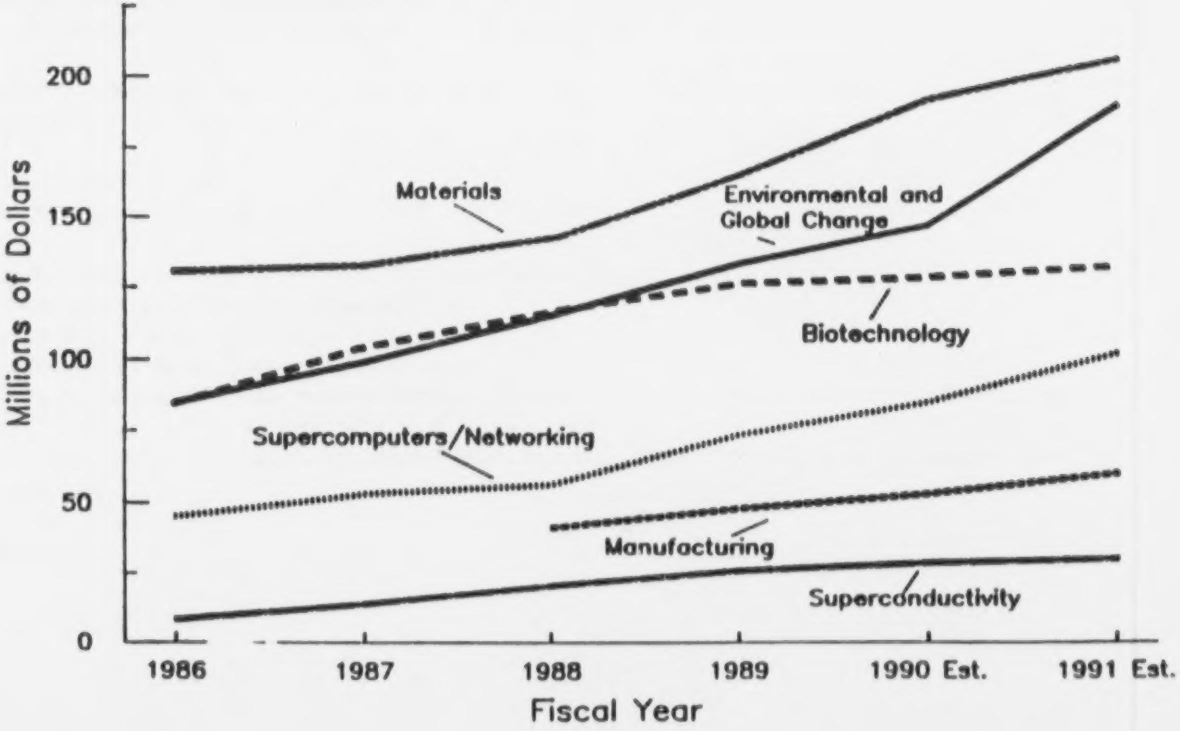


Fig. 13

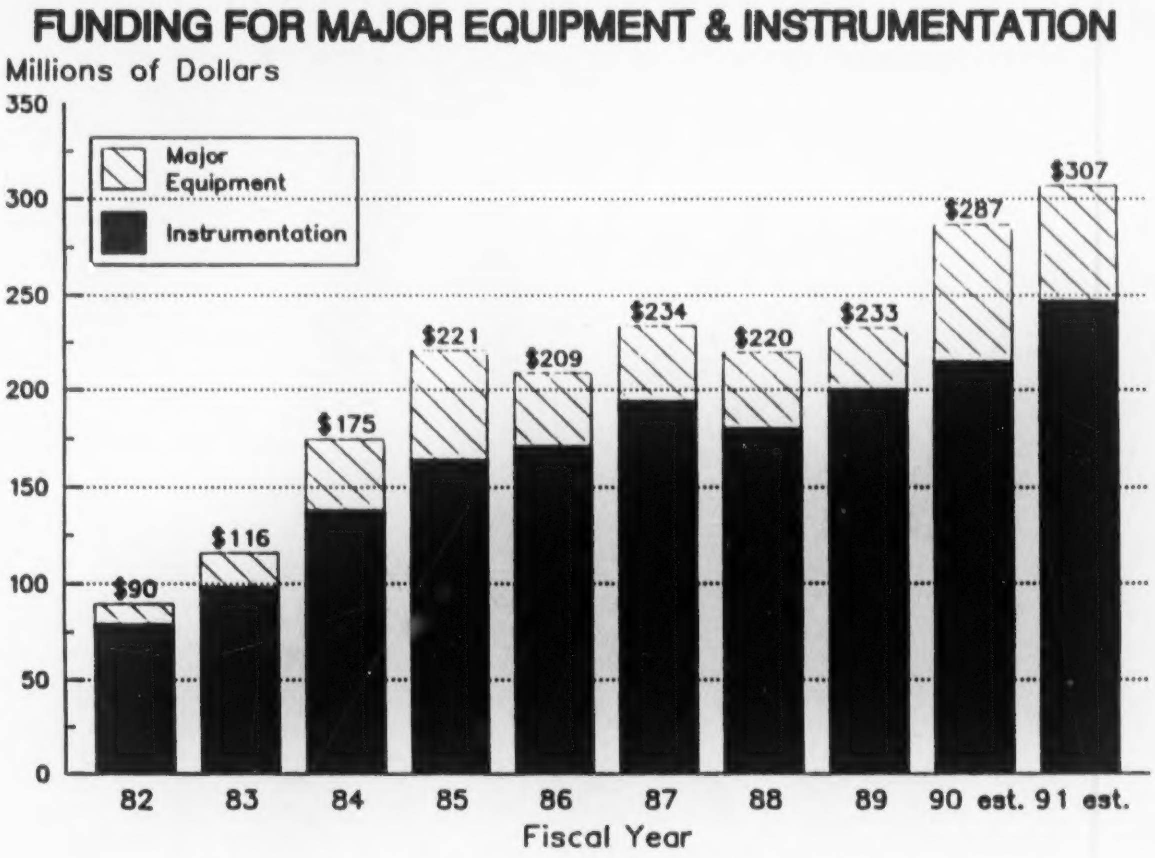

FUNDING FOR MAJOR EQUIPMENT & INSTRUMENTATION
Millions of Dollars
350
300
250
200
150
100
50
0
Major Equipment
Instrumentation
$90
$116
$175
$221
$209
$234
$220
$233
$287
$307
82
83
84
85
86
87
88
89
90 est.
91 est.
Fiscal Year

Fig.: 14

FY 1991 R&D BUDGET INCREMENT

Total R&D Budget Increment = $4.6 Billion

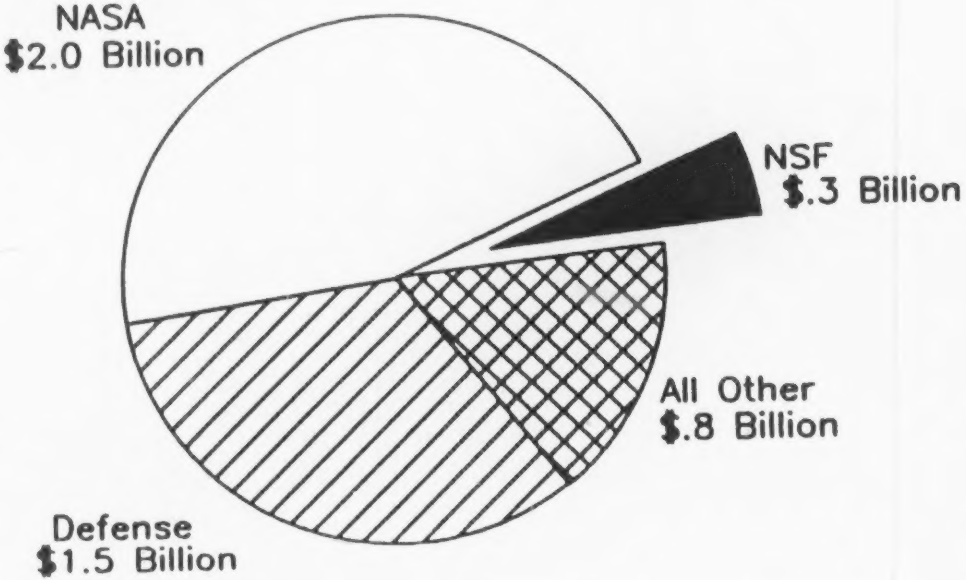
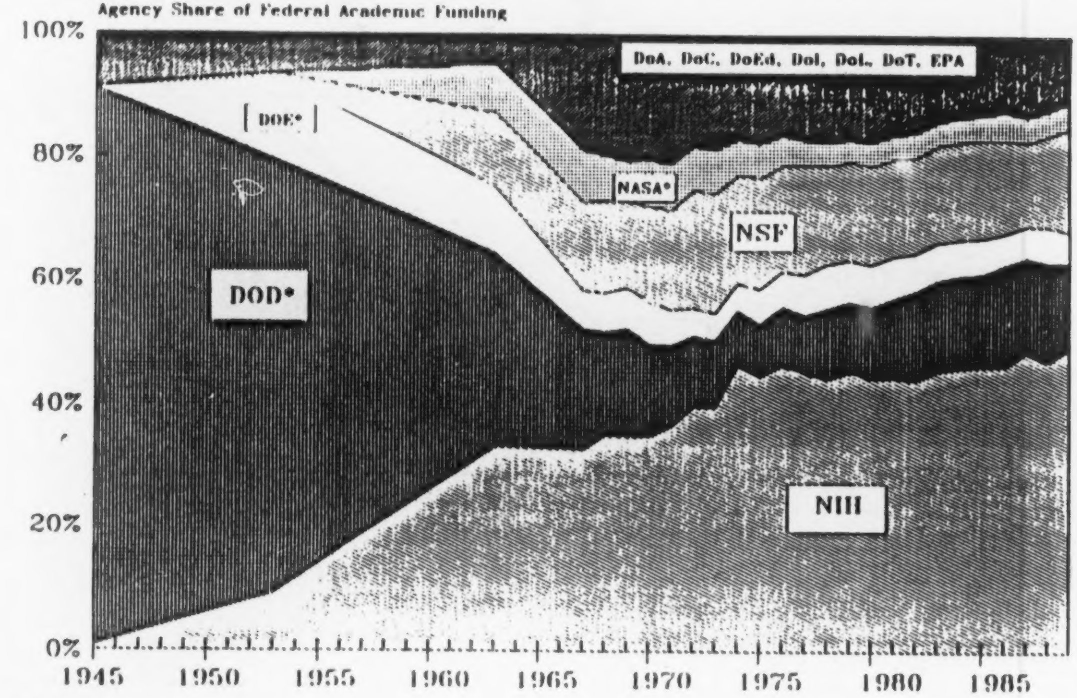


Fig. 15

Postwar Changes in the Influence of Federal Agencies on U.S. Academic Research and Development



* Including predecessor agencies;
Sources 1945-52, U.S. Congress 1963
1953-88, NSF Surveys

Fig. 16

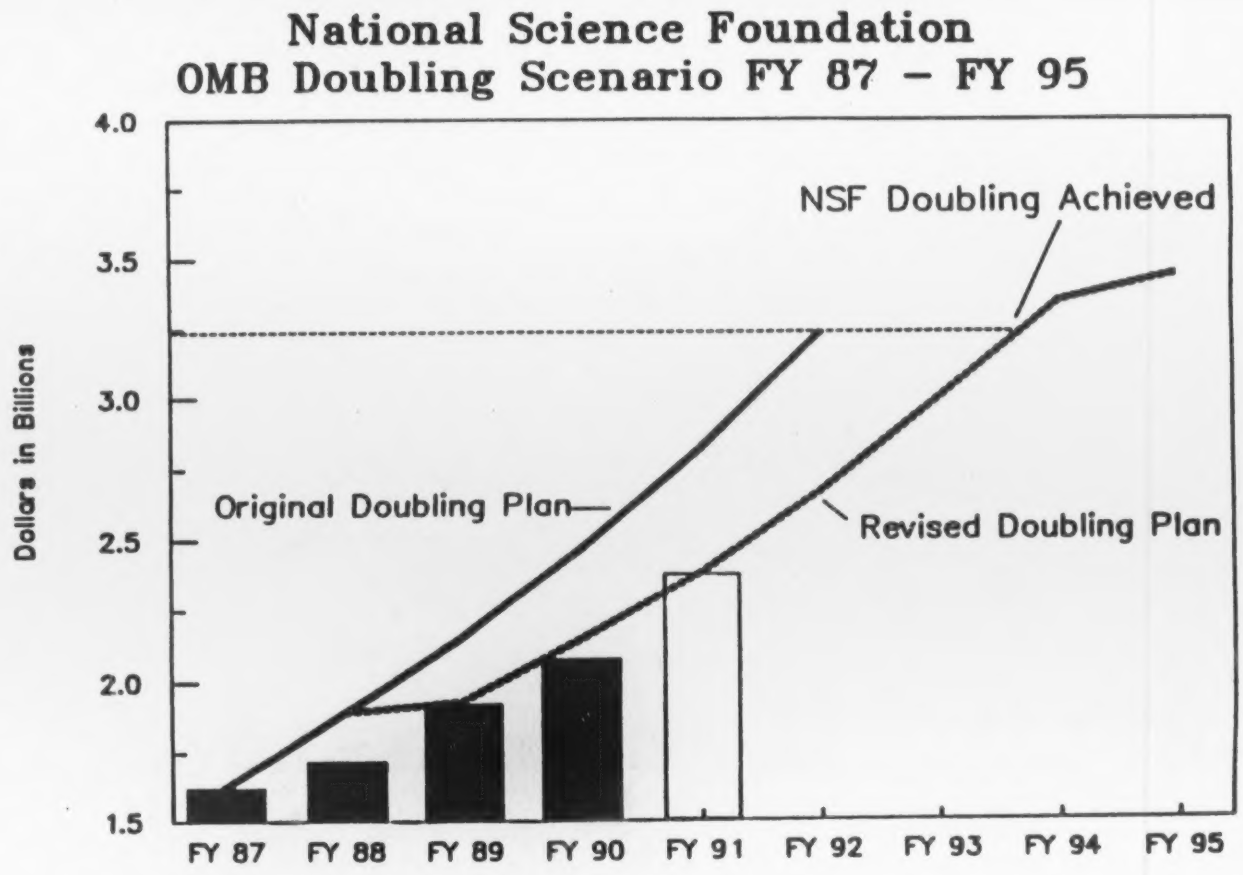

National Science Foundation
OMB Doubling Scenario FY 87 – FY 95
Dollars in Billions
4.0
3.5
3.0
2.5
2.0
1.5
NSF Doubling Achieved
Original Doubling Plan
Revised Doubling Plan
FY 87
FY 88
FY 89
FY 90
FY 91
FY 92
FY 93
FY 94
FY 95

Fig. 17

Senator MIKULSKI. Thank you very much, Mr. Bloch.

We want to acknowledge that our colleague, Senator Wyche Fowler of Georgia, is with us. Senator, we're going to operate on the 10-minute rule, if you want to make an opening statement now or just wish to render questions.

Senator Fowler. I'm ready anytime.

CIVILIAN AND DEFENSE R&D SPENDING

Senator MIKULSKI. Mr. Bloch, I'm going to ask some questions initially about science policy overview. I remember one of our first conversations was essentially about the direction of the country and the competitiveness. I'm concerned about the balance in Federal investment between civilian and defense R&D, and concerned that 60 percent of the Federal R&D is for defense, 40 percent for civilian, regardless of how it's allocated in life sciences or physical sciences.

This brings me to the National Science Foundation. While the 1991 budget requests some small incremental changes in the balance between civilian and noncivilian R&D, it amounts to a shift of only 2 percent. Do you think we should move more rapidly on this front? Do you think that it has the potential for conversion fairly quickly or in a steady kind of way?

Mr. BLOCH. Well, the answer to your question, should we move more rapidly? My answer is "Yes." The shift that has been made, as I pointed out, by the administration, is a major shift from 31 percent to—your number was 40 percent; mine was 39 percent—same number essentially. That shift has occurred over the last 2 to 3 years, and especially in 1991. That's a fairly rapid shift. I think we could accelerate that shift.

My concern is not so much how much we spend in defense R&D but, within the defense R&D budget, how much goes to education and basic research. That's another story. Not enough of their defense budget goes to basic research; it's less than $1 billion out of a total R&D budget that, as you know, is about $20 billion.

Senator MIKULSKI. No.

Mr. BLOCH. Within defense, a shift is also a very important item and subject.

Senator MIKULSKI. Well, Mr. Bloch, in light of the changes in Eastern Europe and Central America, hopefully the emerging democracies will be solidified and stabilized. In your work with the administration, does it have, or is it in the process of formulating a strategic plan to help us move to a conversion economy that would be, on the short leg, specifically immediately realizable. Those things that could be moved to some civilian agencies, like NASA or whatever. Then long range, looking at where we're heading.

Now, civilian agencies could be in almost intermeshing warfare—Alzheimer's research at NIH pitted against physics in your department. I mean we wouldn't want to diminish life sciences but I think your point about the decline of physical sciences is well taken. It shouldn't be either/or. At least that's this Senator's philosophy.

Mr. BLOCH. The point I wanted to make was that we are spending more on the life sciences and biomedical sciences. We have moved away from the support of engineering and the physical sciences. That, we should rectify. The shift in R&D dollars obviously is very important. I don't think this is something that has to come out of the budget requests of the administration and out of Congress.

INTERAGENCY SCIENCE POLICY DEVELOPMENT

Senator **Mikulski**. Well, we could do it program by program, line item by line item. My question, for informational purposes, is, Is there a task force, is there a senior policy group saying, where do we want to be in the year 2000? If we're going to rearrange or redirect our funding, this is the most effective way to do it that would not dislocate our economy and, in fact, enhance our economy.

Mr. **Bloch**. There is, under Dr. Bromley's direction, a reestablishment of the FCCSET committees, which are committees reporting to OSTP. These committees are to pull together agency plans. There are committees for physical sciences, engineering, life sciences, education, and many more.

The result will be better coordination between the agencies. You saw it this year in the global environmental area where such a crosscut was made. There's more behind it than just the numbers in the book. What's behind it is a plan, a strategy, a joint understanding between the agencies and Dr. Bromley of what are the important priorities and how to go about achieving them. There is that mechanism that is being revived.

FISCAL YEAR 1991 BUDGET REQUEST

Senator **Mikulski**. Well, we hope they move quickly because everyone's talking about something called a peace dividend. We don't know if it even exists and everybody wants to get their hands on it. I think we really need a national strategic plan in this area.

Mr. Bloch, I want to move on to the NSF emphasis for 1991 and attempt to get an assessment of the current condition of the pipeline flow and infrastructure.

You propose to double your 1990 budget within 5 years. What we're interested in is, while you're emphasizing many important things, what is the cost to fill and maintain the science pipeline flow and the research infrastructure?

PIPELINE PROBLEMS

Mr. **Bloch**. Well, I don't know quite how to answer that question. When you say, what does it take to fill the pipeline, I can only focus on the following. Let me tell you where there are some problems in the pipeline.

The first problem exists in the precollege area. Fewer students are either prepared or are willing to entertain science and engineering careers.

Senator **Fowler**. What do you propose to do about that, Mr. Bloch?

Mr. **Bloch**. Well, that's why our focus is on precollege education, in terms of teacher preparation, in terms of new materials development, and in terms of taking people that are still in high school and immersing them in an atmosphere of research during summer as an example.

Senator FOWLER. Are any of those programs in place now?

Mr. BLOCH. Yes; absolutely. We have these programs in place. Precollege education has been one of the biggest growing areas in the Foundation over the last 8, 9 years.

PIPELINE ISSUES

Senator MIKULSKI. I'd like to get from you a timetable and some success measures and the improvement in this pipeline and infrastructure issue. One of the concerns we have is that often we think we solve problems by doubling and tripling the budget. We want to make sure the money is used wisely, smarter, and in a steady, measurable, quantitative way. Your field is based on that.

Could you tell us, what is your timetable and success measure for these issues? For example, what is the number of scientists you hope to have by 1994 and how you hope to get there, the technicians, et cetera, as well as the infrastructure and facilities and instrumentation and so on, necessary to do this.

Mr. BLOCH. Well, we'll be glad to submit that to you. Let me just generalize it for a minute. For every program that we have in place in the education area, we have an evaluation program that goes with it, to answer exactly the question that you are asking. What are we getting out of these programs? How many students participate; how successful have they been; how many teachers participate; what is the use of the material that we are developing; and how widespread is its use, and so forth?

We have set this up right from the beginning for our major programs in these areas. As you know, education is a slow process. You have to wait a few years before you see some of the results of that. I don't think you can measure it on a year-by-year basis.

The second thing, consistency of support, is equally important and we have not always done that in the past. In order to be successful, some programs have to be in existence for some time. We have been much too eager to jump from program to program instead of staying with a particular program for a longer period of time. I think that's true in the precollege area as well as in the undergraduate area.

[The information follows:]

IMPROVEMENT IN THE PIPELINE AND INFRASTRUCTURE ISSUE

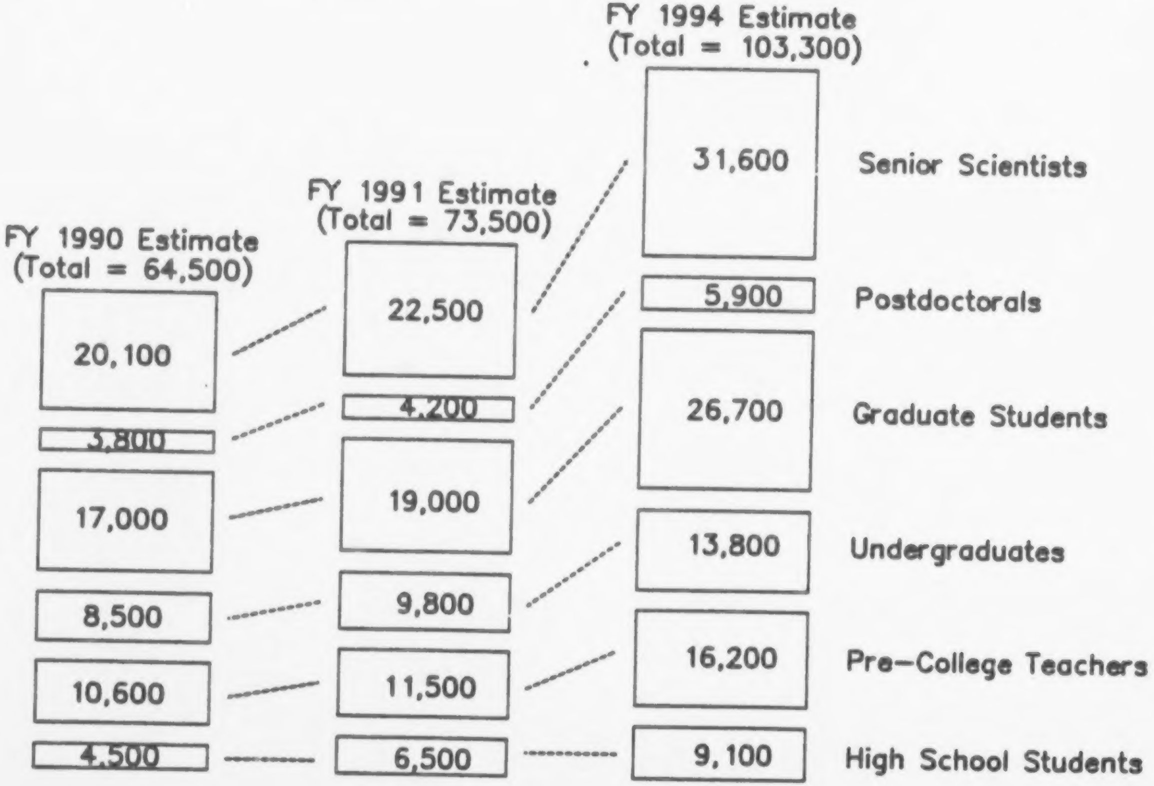
The President's plan to double the NSF budget will support over 100,000 individuals in science and engineering research and education by 1994 (Chart 1), assuming that projections stay relatively constant. That represents a 35% increase in the number of people supported by NSF in just 3.5 more years. Roughly 25 percent of these people will be graduate students attaining their Master's and Ph.D. degrees; another 15 percent will be undergraduates working in research laboratories or attending summer research institutes specifically designed to nurture their interest in science and engineering careers. But, it will also support over 30,000 scientists and engineers nationwide pursuing research either as individual investigators or in small or large groups, or interdisciplinary research centers.

NSF's contribution to filling and maintaining the pipeline will go a long way; but other agencies must do their part. Working together, the R&D agencies of the Federal government can alleviate much of the shortfall in the production of natural sciences and engineering Ph.D.'s projected throughout the mid-1990s.

Attracting precollege students to S&E careers will continue to be a high priority at NSF. But many of our programs are but two to three years old. The precollege spectrum spans 12 years of school and our programs must be maintained and nurtured for a significant span of time in order to assess output in terms of "making a difference in the pipeline". Certainly we will be assessing improvement in scores and interest in S&E, and evaluating the effectiveness of out programs. But, the real tests of success will come a decade from now, when we can look at the pipeline to see if our programs attracted students to S&E careers and alleviated shortfalls projected currently.

Turning to the other point that you raised, the documented need for academic facilities modernization is too great for any single agency to manage (see Modernizing Academic Research Facilities: A Comprehensive Plan, June 1989). The plan, set forth just about one year ago, lays out a comprehensive set of activities that institutions, states and local governments, the Federal government and industry can take to provide the research facilities that are sufficient in terms of numbers, size, condition, adequacy, and location to support the nation's basic research and research training efforts.

NATIONAL SCIENCE FOUNDATION SUPPORT FOR HUMAN RESOURCES



Senator **Mikulski**. Well, Mr. Bloch, I think you make an excellent point. It's really the goal and objective that I hope to pursue, as the chairperson of this subcommittee, working with my very fine colleagues.

I truly believe that, while we continue to want to develop high technology, it will depend on our personnel. As you know, there's an OTA study that talks about scientists and engineers—grade school to grad school. It is an excellent book and it pulls together your work and the other agencies and so on.

I know in the 2 years that I have left, we hope to have a steady policy that we pursue here. That, as we work on research, science education will continue to be an integral part of that.

I'm going to be asking questions more about this, but I want to be sure my colleagues have a chance and I'll come back for some second rounds. Could you tell me, as we then move on, how do you feel that the National Science Foundation is responding to the recommendations of the OTA report?

Mr. **Bloch**. I feel that we are responding exactly the way that we should be responding. The education programs that we are talking about—as you mentioned in your opening statement yourself—from grad school to grade school or from kindergarten to grade school, is one of our highest priority programs.

I think we are pretty much in agreement with that report. There are some things in the report, I must tell you, that I am not in agreement with.

SCIENCE EDUCATION: CENTRALIZED OR DECENTRALIZED

Senator **Mikulski**. Well, I know that, one is that they recommend you strengthen the leadership role in science education by having a centralized department and you have it spread over all the directorates.

Mr. **Bloch**. That's correct.

Senator **Mikulski**. Their argument is that the heads of your directorates are interested often in funding some of the high-tech research programs, and education comes as a secondary thought.

These are the comments. I'm not saying they're mine, sir.

Mr. **Bloch**. Right. Let me give you an answer for that. I have thought about that for a long time. We had many discussions on that inside the Foundation. I think that would be exactly the wrong approach to life. I'll tell you why.

There are many programs that are centralized in one group. All the precollege programs are in the Directorate for Science and Engineering Education. There are programs in undergraduate curriculum development, for example, which are spread throughout all of the research directorates. We want research directorates to feel that they have a responsibility for education and not just research. It's very important.

It's also very important to couple the disciplinary community with the education programs. That's why I kept it decentralized, to make sure that there is an interest across the board in education and not just in one part of the National Science Foundation.

You know everybody focuses on organization as a solution to a problem. It very seldom is the solution to a problem. I feel that's the way we are operating today. I must say that although there are other viewpoints on that one, it is about the best way we can do it.

Senator MIKULSKI. Well, Mr. Bloch, I want to return to that.

I know that ordinarily we rotate on a partisan/bipartisan basis. But Senator Fowler was the next to come after Senator Garn. Senator Garn has left. If he has any questions for the record, they'll come in.

Senator Fowler, then I'll turn to Senator Grassley.

Senator FOWLER. Thank you, Madam Chair.

Mr. Bloch, I think, if anything, your report and your estimate underestimates.

Mr. BLOCH. The needs.

PRECOLLEGE EDUCATION

Senator FOWLER. That's my complete opening statement.

Continuing what we were discussing, I know the Science Foundation has spent considerable resources, as you were describing, in the precollege years, trying to develop some science and math interests leading to expertise.

The reports and some research done on my staff show that we're having trouble, though, with dropouts in the freshman and sophomore years of college, especially with women and minorities.

Mr. BLOCH. Right.

Senator FOWLER. I've got all these figures that you need, that you know about. So I won't read them to you.

What are we doing to strengthen the retention rate of those who successfully complete your precollege program, to keep those in, especially the minorities and women?

INFRASTRUCTURE

Mr. BLOCH. We're doing quite a bit in that area. Your comment is absolutely right. The dropout, especially for minorities and women, in certain disciplines is higher than for the average population. For the average population, it's high also.

One of the things that we started doing a couple of years ago and have been increasing—and it will increase again in 1991—is to provide a better environment.

Let me define what I mean by "environment." First of all, I mean laboratory equipment. We have obsolete laboratory equipment in many of our undergraduate and research schools that is used to teach undergraduates. The interest in these subjects drops off and people move on.

The second one is to make sure that the curriculum that we are presenting in these schools is up to snuff and it is effective. We have spent a lot of dollars in equipment, in curriculum development.

Now, in the minority and women area, and especially the minority area, we have started programs that take students when they're still in high school and interest them in science and engineering careers and prepare them for that. So that they have a head start once they get into the undergraduate colleges and universities. That's one major area.

SCIENCE EDUCATION

Senator FOWLER. Well, I'm not convinced. I may be wrong but I'm looking at your own figures here, and the critical need, if you're right—on page 2 and 3 of your prepared testimony—that: "By the year 2020, minority students will be 50 percent of the total" of all college students. But "by the year 2000, the number of college age people will be below the number in 1970." And that, in your words: "Our work force will be increasingly made up of women and minorities."

We've got to do something that I hope we can do as an institution, as a nation, in motivating those people. I doubt it's better laboratory equipment, quite frankly. That may be a part of it, though. Whatever we're doing, I hope that we will redirect our attention. Your own figures make the compelling case why it's necessary, if we're not going to get some women and minorities in the engineering, science and math, keep them in there, develop them in there, so that they can then contribute to the country, then we're in bad shape.

Mr. BLOCH. I don't think we have any different views on that. In your previous question you focused on the dropout in undergraduate education. That's why I mentioned to you equipment and curriculum and preparation to keep the people in that pipeline.

In order to get them to that particular point, we're funding proposals in the precollege area, to give a better education to our precollege students.

Senator FOWLER. Well, we're all on the same side. I'm just saying the figures show that it's not working. So we've got to look at it again. We've been working in the precollege area, using this as a primary emphasis for 7 or 8 years, as you testified, and we're still getting alarmingly high dropout rate, even after precollege preparation, then we've got to do a better job.

Mr. BLOCH. That's the point I made before to Senator Mikulski. I think we have to show some persistence and some patience. You're not going to change the culture overnight. You're not going to make the massive change that is required overnight in a country like the United States, where you have a diffuse education system.

Senator FOWLER. Let me ask you a couple of other questions because the time is short.

Mr. BLOCH. I think we need to be patient.

Senator FOWLER. Well, I know—I mean, we're preaching to the choir. We've just got to stay on the case. I don't think the record shows that we have made much progress.

Senator MIKULSKI. I'm sorry. I didn't hear that. We haven't made much progress in what? I didn't hear you.

SCIENCE AND TECHNOLOGY CENTERS

Senator FOWLER. In keeping women and minorities in engineering.

Mr. Bloch, let me ask you about your science and technology centers, which I also think is one of the most important catalysts for creativity in interdisciplinary science. We've been doing this clean air bill for 6 or 7 weeks. It's the only bill we've done this year.

Down at Georgia Tech, we've got an application pending to establish a center on indoor air quality. If we can't clean up the outside, we want to try to clean up the inside. How are we doing?

Mr. BLOCH. Who's "we"? Georgia Tech, you mean?

Senator FOWLER. No; I'll go national. How can you describe what's in store for the future of science and technology center programs for the next fiscal year?

Mr. BLOCH. Well——

Senator FOWLER. How many are you going to set up? Then I'll figure out whether Tech will be one of them.

Mr. BLOCH. I see. Well, I want to broaden the question a little bit. Besides the science and technology centers, we also have engineering research centers, OK. Let me put them all into the same pot, because they should be.

They are in different areas. One is in engineering; one is in——

Senator FOWLER. No; first of all, answer the question. How many science and technology centers are you going to set up?

Mr. BLOCH. I'll tell you exactly. We funded 11 centers last year. We have a competition going right now that, depending on the outcome of the 1991 budget, will probably fund or could fund another 8 to 11 centers.

Senator FOWLER. You want to? You're planning to?

Mr. BLOCH. We want to; that's our request.

I should tell you that in 1990 we had the same request then. We didn't get the money, so we didn't fund it. A lot of it depends on the outcome of the discussion we have here and the actions of Congress. But that's our plan.

We have 21 engineering research centers right now, which have been established over 5 to 6 years. We're not planning to increase that number. What we want to do there is take the centers that we have and stabilize them and give them needed increases, rather than adding more centers and having all of them inadequately funded. That's our plan and obviously it depends on the outcome of our budget request. But it's in our budget request.

Senator FOWLER. You understand that indoor air quality is equally as important as outdoor air quality?

Mr. BLOCH. Absolutely.

ANTARCTIC PROGRAM

Senator FOWLER. One final quick question on the Antarctic program. Again, I think the committee has been very supportive of your efforts in the environment, safety, health issues surrounding our program in Antarctica.

You've got—you asked for nine LC-130-20's—skis and everything necessary, you said, to finish the program. I think you've got seven of them in operation.

Mr. BLOCH. We have seven in existence, right.

Senator FOWLER. What about the other two?

Mr. BLOCH. Well, the other two are not in our 1991 request.

Senator FOWLER. Why not?

Mr. BLOCH. Why not? There is just so much that we can put into the 1991 request.

And we started——

Senator FOWLER. Well, your original request was that you needed nine to do the mission.

Mr. BLOCH. That's right. They are in our plans, OK? The funding for that one you will see in the 1993-94 budget. We have——

Senator FOWLER. But you lost the 3-year production time. If you ask for them in 1994, they won't be ready until 1997 or 1998. If you push that up——

Mr. BLOCH. Well, yes, 1996, 1997; you're right. But there's just so much that we can put in our budget request. Look, this whole area of Antarctica has been on the forefront of our concerns.

We started in 1990 a program called safety, health and environment in——

Senator FOWLER. Let me ask you this, Mr. Bloch. If the funds were appro—and this is important. If the funds were appropriated this year to begin procurement of the airplane, which would pull it up 3 years, which you're losing if you wait, would you be able to put these planes to use immediately?

Mr. BLOCH. There's no doubt about it. We can put the planes to use. But, by pulling it up, I hope you don't have in mind taking the money out of some of the other areas that we are also short in.

Senator FOWLER. Well, that's what we're here to decide, isn't it?

Mr. BLOCH. Yes; in the end that's what we are deciding, but I just——

Senator FOWLER. Well, those of us who are supporting the doubling of the budget, as requested, for the National Science Foundation do have some leeway, do we not, in helping you determine the priorities?

Mr. BLOCH. Absolutely.

Senator FOWLER. You wouldn't have any problem with that, would you?

Mr. BLOCH. Well, I——

Senator FOWLER. You see, I don't want to just be right; I want to be true. [Laughter.]

Mr. BLOCH. Well, I might have a problem in the end, OK? Because of what I said a minute ago. This program, in particular, that you are focusing on—the two LC-130's—the whole Antarctic program is a very difficult program, as you will appreciate, and a very costly program, as you will appreciate, to pull off.

I think we have tried to lay out things in a priority way, the way we see it and the way we see the need. What we are always faced with—and I've seen it in other areas—Congress makes a change; it affects something else that is equally important.

ANTARCTIC AIRCRAFT NEEDS

Senator FOWLER. Well, Mr. Bloch, again——

Mr. BLOCH. I'm not saying you shouldn't do it. I'm just telling you that we have thought about that. It's not a novel idea or a new idea.

Senator FOWLER. You remember you told the chairman that you didn't play this game of asking for more than you need, and asked us to accept that.

Mr. BLOCH. In fact I asked for less.

Senator FOWLER. You told us 3 years ago that you wanted nine planes to complete that mission. A lot of us went to work to get you the nine planes. Now you come back a couple of years later and are going to ask for them in 3 or 4 years; that's 7 years off.

So it didn't sound like—you either didn't need them when you asked for them or——

Mr. BLOCH. No; I——

Senator FOWLER [continuing]. Or we've got to complete the mission. So I just want to take you at your word. You can't have it both ways.

Thank you, Madam Chair.

OTA REPORT ON EDUCATION

Senator MIKULSKI. Thank you, Senator Fowler and thank you for the questions you asked on the education.

As I turn to Mr. Grassley, I want to bring to your attention and to the other members of the committee this very fine OTA report entitled "Educating Scientists and Engineers: Grade School to Grad School." The issues that you raised concerning women and minorities in education are addressed in this book.

We've got the research. We know what we need to do. Changing the culture is slow, but Susan B. Anthony and Abigail Adams have been at it for 200 years. I think it's time we got with the program.

It is the intention of this chair, in looking for support from her members to implement the recommendations of an OTA report. This is one Senator that says if you do the studies and you get the report, then we ought to act. I think you'll find it very informative, particularly in the areas that you want.

Just let me tell you, a new study out of Baltimore in science and education, and a lot of what happens to little girls and little African-American kids happens in the elementary school. Of the 4,389 courses taken by elementary school teachers in Baltimore to be recertified, only 13 of those were in math and 24 were in science. They are rewarded for moving into administration, rather than moving ahead. So it's that kind of stuff.

Senator Grassley, we look forward to your opening statement and questions.

Senator GRASSLEY. OK. I don't have any opening statement. I just want to ask questions.

Senator MIKULSKI. Sure.

KNOWLEDGE TRANSFER

Senator GRASSLEY. I want to present a letter to you. I'm not going to ask you any questions on this letter. I'm just giving it to you so you'll give it your personal attention.

My first question is on a subject that you brought up on page 1 of your presentation. You discuss how research and education are vital to our economic competitiveness. Of course, I wholeheartedly agree with that.

You also mention that the transfer, and this is your quote: that "the transfer of knowledge from producers to users" is built into the framework of the NSF budget. So I'd like to have you explain to me just how that transfer is going to be encouraged by NSF. I'd like to have it be done in specifics, not generalities.

Mr. BLOCH. OK. Let me give you some specifics.

Senator Fowler before focused on centers, science and technology centers. I included engineering research centers in it.

There is a definite focus on transfer of knowledge because before these centers were established, they had to submit a plan as to how they would involve industry in their center operation, be it in the research itself—by bringing people in from industry—or by holding meetings with industry or by having industry contribute to any part of the research or contribute in terms of equipment; it doesn't matter in what form. That's a direct coupling between the centers and industry itself.

I should tell you that in many of the centers that have been established over the years, industry participates and contributes as much as the Federal Government.

Senator GRASSLEY. Is the——

Mr. BLOCH. That's one example.

Senator GRASSLEY. Is the assumption here?

Mr. BLOCH. The assumption is that the best transfer is between people.

Senator GRASSLEY. Yes; but the greater that connection the more apt they are to be funded? Is that the inference in what you're saying?

Mr. BLOCH. No, no. The funding was not even the prime attempt there. The attempt was to couple these two sectors closer together. The best way you can do it is not with laws or by writing papers. The most effective way this can be done is by people-to-people interaction.

I'll give you a second example. We have a program called the Presidential Young Investigator Program, which is aimed at attracting and keeping young people in universities. The program depends on matching funds from industry with the individual investigator.

Again, the question was not one of money. The question was of coupling a young faculty member closely to industry with industrial activities and research. That's a second example.

Many of our programs have that built in, as I said before, into the fabric of the programs.

SCIENCE EDUCATION: PRECOLLEGE

Senator GRASSLEY. The next question—and it's something you addressed in your statement and we've heard it from many sources and studies recently—that we're going to face a shortage of scientists and engineers in the future if we don't act to encourage students to pursue these avenues.

I recently heard one report the other day that said students are now deciding, at the elementary school level, that science is too difficult to pursue as a career. Under the precollege program that you mentioned, what emphasis is there on elementary education level, if any?

Mr. BLOCH. I assume you mean elementary science and mathematics.

Senator GRASSLEY. Yes.

Mr. BLOCH. There is a heavy focus on materials development, new curriculum development that presents the material, or science, in the best way possible. There is a focus on teacher training, because the teacher has to understand and transmit the information.

We are giving high school students experiences in the research laboratories so that they can experience what science is all about and how it's being performed.

REGIONAL INSTITUTION REPRESENTATION

Senator GRASSLEY. Referring to page 5 of your statement, you cite your agency's efforts to: "Broaden the participation of underrepresented groups through programs designed to recruit and retain women and minority faculty and students, as well as support a broad spectrum of institutions and regions."

You go on to mention various minority programs. However, it's not clear to me—so this is my question—how you plan to address the question of institutional and regional representation.

Mr. BLOCH. In terms of institutional and regional representation, we have programs that are regionally oriented, especially the Minority Research Centers of Excellence that we have established in six urban locations—New York, Washington, DC, Texas, Georgia, Puerto Rico, Alabama, and Tennessee.

When a center is at a university, we are reaching out to the high schools and elementary schools to focus on students, to focus on teachers also, to give them the right resources to attract minorities to science and engineering careers, by giving them an early exposure and the best possible education in their early years.

Senator GRASSLEY. So it's more on an institutional basis than on a regional basis; is that right?

Mr. BLOCH. It's on a small regional basis. It's focused in one institution. But it reaches out to other institutions that are in that particular region. The CUNY New York City Center reaches out to all the colleges—2-year colleges and 4-year colleges.

We have other programs that focus on regions. We just announced a State initiative for education where we're asking the States to come in with a comprehensive program that will be cofunded by the National Science Foundation and the State. In a particular State, the entire precollege educational process, or as much of that process as the State sees a need of improving is addressed.

As you know, we have a program called EPSCoR, which focuses on the States' research funding capabilities. The research institutions in that State focus on science and engineering research, as well as education.

SPECIALLY FOCUSED PROGRAMS FOR MINORITIES

Senator GRASSLEY. All right. Now you may have just, in some of your explanation, answered this question. But let me ask it anyway because I want to speak in terms of special programs.

In the area of minority representation, do you favor using special programs such as those you've outlined to increase minority participation, or do you believe it can be handled within each regular program area?

Mr. BLOCH. Well, unfortunately, the answer is both. We would like to have programs that are spread throughout all of our directorates. For instance, in the computer area, the Minority Infrastructure Program is one example.

We have also some central programs that focus specifically on minorities. We need both of these. I don't think it can be one or the other. We would like to mainstream a lot of these special programs when the time is right. But many times we feel the need to start a special program.

FACILITIES MODERNIZATION

Senator GRASSLEY. You mentioned in your statement about funding for facilities' modernization. Last year you made no request for funding but we saw, in this committee, to allocate $20 million to demonstrate our commitment to seeing this program move forward.

This year, you're requesting only an additional $20 million, which will be added to last year's amount. It's my understanding that that will then be enough to make the first grants.

My question is whether or not you don't think that this is a rather modest request, if we're to see this program get off the ground the way that we—I think the way that we implied it ought to get off the ground by our adding the money when it wasn't requested last year?

Mr. BLOCH. Well, Senator, our total request is a modest request. Last year's appropriation limited the $20 million for the next 3 years, I guess, 2 or 3 years. That's why you see the $20 million.

We are going through the selection process right now. We have received about 450 proposals.

Senator GRASSLEY. OK. Madam Chair, I'll submit the rest of these questions for the record.

Senator MIKULSKI. Senator, out of respect for you and also your patience that we are operating under the 10-minute rule, is there a particularly pressing one in addition to that, or would putting them in the record be satisfactory? You're always an extremely considerate Senator and I would like to offer you the same courtesy.

Senator GRASSLEY. I think if I could ask just one of the three questions, and then I'll put two for response in writing.

Senator MIKULSKI. Why don't you go ahead and do that. We'll be happy to allow you that.

FAST TRACK PROPOSAL APPROVAL

Senator GRASSLEY. Thank you.

I need an update on the status of the fast track project proposal approval. Last year your response to me was that you were pleased with the experiment and hope to expand it to the whole Foundation.

So could you please run down for me the current status of the project—how it's been received by the research community; how many proposals have been approved in this matter; and the future of the project?

Mr. BLOCH. We talked about it last year when it was strictly a program in the Engineering Directorate, if you remember. In the meantime we have expanded it to the whole Foundation. This year, 1990, is the first year where we will have it foundationwide. We have to see what comes in.

We had some very good results in the engineering area, where it has been in existence for about 3 or 4 years. We have to see what comes in now.

Ms. Toye points out there are 126 requests and there are already about 47 that have been approved for funding. It's working the way it should, inasmuch as it has a rapid approval process. It focuses on new areas that otherwise would not get funded because of the uncertainty of the research. It increases the risk that people can take and should take. I think it will be a very important program. It's limited, as you know, to a one-time grant of maximum of $50,000.

Senator GRASSLEY. Been received well by the research community?

Mr. BLOCH. From what we can tell by the numbers; yes.

Senator GRASSLEY. Now what—maybe you gave me the numbers. What are the numbers, the number of proposals?

Mr. BLOCH. Well, the number of proposals that have been——

Senator GRASSLEY [continuing]. Approved?

Mr. BLOCH [continuing].-Approved—47.

Senator GRASSLEY. Forty-seven.

Mr. BLOCH. And 126 submissions.

Senator GRASSLEY. I am going to submit the last two questions for answer in writing. I would like to point out that one of my questions deals with the *Kalb* case. I would ask that you give personal attention to the response to my question.

Mr. BLOCH. I will certainly do that.

Senator GRASSLEY. Thank you.

"RIGELY WARFIELD" VESSEL

Senator MIKULSKI. Dr. Bloch, we're now going to turn to our very able colleague, Senator Bob Kerrey of Nebraska, who's taken a very keen interest in this subcommittee, for which we're most appreciative.

I, however, am going to have to excuse myself. There's a hearing on metro funding, which the Maryland Senator must go to. Before I go, one, let me thank you for the leadership you've provided and, particularly, the energetic response in the area of education.

As you know, last year, I tried to raise the consciousness of the research community. I think that's happened. I think I was able to do that because of the support that I received from you on how we could do both research and—it wasn't one or the other.

A couple of practical Maryland questions, though, as you know, there is a maritime environmental research vessel that is currently being operated by Johns Hopkins, called the *Ridgely Warfield*. Can you tell us if NSF has made a decision on reassigning that to the University of Maryland, where it will continue to be docked in the

Chesapeake Bay and continuing their most important and critical marine research?

Mr. BLOCH. We looked at it and I just signed a letter to you this morning, telling you that the decision has been made and the transfer will happen.

Senator MIKULSKI. Well, thank you, Mr. Bloch. We're very grateful. Because it will keep the vessel afloat. Maybe we ought to rechristen it and call it *Chip Off the Old Bloch*. [Laughter.]

Senator MIKULSKI. Don't worry. My appropriations will be better than my jokes.

Mr. BLOCH. Am I invited to the christening?

Senator MIKULSKI. You bet; you bet. In fact we'd like you, if your time permits, to be with us at the Hubble launching which again, through your work and initiative and NASA, again showing that not only scientists learn from science. The Hubble will be Goddard, Johns Hopkins Space Institute—a tremendous science education component and so on.

Mr. BLOCH. Thank you.

NSF RELOCATION PROGRESS

Senator MIKULSKI. The last question that I have, before turning to Senator Kerrey, the National Science Foundation location. Could you tell us the status of that and where you think you're heading? Because you talked about the administrative support. We do want to talk to you in more detail about pay and FTE's and call of those things, so that you can have the resources to spend the resources we give you.

But the relocation, I know you're cramped and——

Mr. BLOCH. We are cramped. As you know, we had a solicitation out. That solicitation has received its inputs. The inputs have been looked at. We are within, probably, a month of making a decision. It has been narrowed down to about five particular locations— all, as you requested, within the metropolitan area.

Senator MIKULSKI. Are any of those in Maryland?

Mr. BLOCH. In the original submission, there were some in Maryland.

Senator MIKULSKI. But the top five aren't?

Mr. BLOCH. No; none of the five finalists are.

Senator MIKULSKI. Well, as you know, I think that two of the major flagship agencies in science and technology are in Maryland. This is not a Maryland pork barrel. As you know, an incredible expenditure of research is in the life sciences, not necessarily in your budget. I think one of the Federal jewels is the National Institutes of Health. Then we have NASA, of course, with Goddard and so on.

What we have in Washington are agencies that must relate to the President. What we have in northern Virginia is the Department of Defense. Now, if they're going to buy you up and buy you out, don't worry. I'll prevent a hostile takeover. [Laughter.]

Senator MIKULSKI. I'm not happy with the GSA thrust.

Mr. BLOCH. I don't think there is any danger that they buy us out. But let me say that, as you know, it's a competitive process that we have to go through.

Senator **Mikulski**. I know. Well, GSA has really been dragging its guidelines on a lot of things. So we'll be talking to them on that.

Senator Kerrey, you were quite patient with me to allow me to go to my hearing. Thank you. I'm sorry I'm not going to be here to listen to the pointed and colorful way that I know you'll proceed.

Senator **Kerrey**. Thank you.

I've got you all to myself, Mr. Bloch.

Mr. **Bloch**. Yes.

Senator **Mikulski**. Hang in there; he's all right. [Laughter.]

Mr. **Bloch**. Thank you.

Senator **Kerrey**. I've got an opening statement and a bunch of other questions that I'll just submit for the record and for being answered later.

[The statement follows:]

STATEMENT OF SENATOR KERREY

I welcome Erich Bloch and the other representatives of the National Science Foundation. As you know, I am very interested in both your research activities and your science and engineering education programs. I look forward to working with you.

The National Science Foundation is a winner in this year's budget. It comes before us with a fiscal 1991 request which reflects a 14.4 percent increase over the current plan. For research and related activities, the increase is 13.3 percent and for science and engineering education, to which I attach a particularly high priority, a 22.9 percent increase. Furthermore, the Foundation is basking in a renewed interest and concern -- and hopefully a commitment -- to expanding research opportunities and enhancing our efforts in the field of education.

I am here today as a supporter of your efforts and your request. The Foundation has done much in the past four decades to advance education and research. I have no question that our premier institutions, our Nobel laureates, our technological base are indebted to the support you have provided.

But, I am also here today as a Senator from a state and an area which has had mixed results with the National Science Foundation. We have had a few successes -- and for those we are grateful -- but we have generally been treated as the country cousins of the well-established institutions. And, I fear that the Foundation has yet to discover - or admit - that our quality of research and education is competitive. The comments which come back on the review pages often simply reflect a real ignorance of what is going out outside the established circle.

And, finally, I am here today as one individual dedicated to improving the educational opportunities for all Americans -- East and West, North and South, urban and rural, public and private, elementary and secondary as well as undergraduate and graduate. Whereever our people our, that is where we must be. Whereever our best is, there we must be -- and that is the easy part -- but whereever we need improvement there we must also be. Your own figures and statistics show that we must reach out to segments of the population which have traditionally not been attracted to science and engineering. Our concern with economic competitiveness, which you mention in your opening statement,suggests that we need to broaden the base of support. But, perhaps most important of all, the future of our society depends upon it. As the former editor of The Economist noted before his retirement, "The test for social cohesion is not the achievement of the top 1% but whether the great average mass is turning civilised scholarly..." He is correct. Our top researchers and scholars -- as important as they are -- represent only one aspect of what we must do to insure that we maintain a technologically competent society. You have, I suspect, done well in helping the top 1%, even the top 10 percent or more. But, I think the jury is still out on the Foundation's ability to move beyond that into areas where it has not traditionally operated and to reach a wider segment of our institutions and people. I know that you've looked at some state-wide programs and some programs for urban school districts. I hope we will see a a new and heightened focus on strengthening those areas which have not previously been your principal beneficiaries.

MERIT REVIEW

Senator KERREY. Generally, I guess I'd say I think the budget you submitted is a good one. I'm pleased to see that the administration is putting an emphasis, a continuing emphasis, on NSF. I'm pleased, in general, to see the distribution within the budget itself.

There's a couple of areas of continuing concern for me. One is—I regret that Mary Good can't be here perhaps to respond personally but there was an interview in your publication last year with questions and answers. At one point she was asked what she thought of the Merit Review process. And her quote was:

> I think you'll see some changes. Peer review works very well if I can fund one or two or better of the good proposals that I get. But if I'm funding 1 out of 10, then I don't know what peer review tells me anymore, since at least the top 4 are of indistinguishable quality.

And here's where the thing gets a little murky:

> Some criteria other than quality must come in. Then you'll begin to see prioritization and decisions based on what area of science you think ought to be funded.

Do you agree with that assessment?

Mr. BLOCH. Mary Good is my chairman, so let me say that first. No, I don't quite agree with it. I agree in part with her and we had some discussions on it.

First of all, let me say one thing. The merit review process is not a static process; it's a dynamic process. We're making changes to it; we have made changes to it. We're trying to exactly address some of the issues that she brings up.

There's no doubt about it that it's much more difficult to make a decision when you have 100 proposals and you can only fund 10, than if you have 100 proposals and you can only fund 30. The gradations between one proposal and the next one is a lot more difficult to determine, when you have a small number to fund. But we are managing to do that.

I don't think we have any program where it's as low as 20 percent except in the centers program. That's a different category.

Our average for individual investigator grants, is about 30 percent that we are funding. There you can really deal with the problem. But, despite the fact that it's difficult to do, even at a 10-percent level, I think we have to find ways, and still differentiate and still make the right decision. It means more work for the people that are managing the program; it means more work for the people that are judging and evaluating the particular proposal. But I think it can be done.

What is the alternative—rolling dice? I don't think that's the alternative.

Senator KERREY. No. No, I'm not suggesting that's the only alternative at all. I guess the operative question for me is whether or not there are other criteria than quality that in fact——

Mr. BLOCH. Absolutely. There are four criteria that we have in front of us whenever we make a decision, regardless of what the level is. The first one is obviously the excellence of the proposal, the quality of the proposal; the relevancy of the proposal to that particular science; how important is it? That's an important criterion and a lot of priority decisions are being made on that. Maybe it's a good proposal, but within the framework of the overall program, it may not be relevant at all. So relevancy is the second proposal.

The contribution it makes to the infrastructure is the third criterion. By infrastructure, I mean of the science, of education, of a particular institution that comes forth with the proposal. That's the third one.

Finally, competence what the proposal describes should be accomplished. We are not just looking at the quality and the excellence of the proposal. There are four major criteria that have been spelled out and that each proposal is judged by.

MERIT REVIEW

Senator KERREY. What about her statement that decisions are based on—also end up being based on what science you think ought to be funded?

Mr. BLOCH. Well, that's true also. I mean look at our budget request. Our budget request really tells you which science areas we see are the most important ones. We might have many more proposals in one area, where we have a low-funding level, than we have in an area where we have a high-funding level. That can happen.

Senator KERREY. Well, I guess I——

Mr. BLOCH. Our budget is really a statement of our priorities on a broad scale.

Senator KERREY. I guess—I would like in fact for— and I was going to ask Madam Chair to do it, and since I'm Mr. Chair, I can do it on my own—that a copy of this little colloquy be shipped to Dr. Good for her comments on it.

Mr. BLOCH. I'm sure she'll be delighted.

Senator KERREY. Well, I'm sure I will as well.

As I understand her saying, the four considerations that you've isolated, all are a part of quality. All are a part of the quality considerations that go into evaluating its impact in the context of the other research that's going on, evaluating the likely outcome. All those are a part of the qualitative analysis of the peer review—of the merit review.

What she's suggesting is that you get down, with large numbers of applications—if you have 10 applications, you're apt to have 3 or 4 that are equal, at least as you factor all of these different considerations in. Now you're at that moment. Then other considerations have to be brought to bear.

Mr. BLOCH. But that's always true. I don't see how— even if you have 20 criteria in front of you, there will be 2 proposals or 3 proposals that are equally good, from all of these viewpoints. Then there's only money to fund one. You've got to make a decision. That's what people get paid for—to make decisions.

Senator KERREY. I understand that people get paid to make decisions, Mr. Bloch. I'm trying to determine what other criteria are made and are there some consistent criteria that are being applied to make those determinations.

You say, you can't roll the dice. But, essentially, if you get down to four and you don't have any other declared criteria, you are rolling the dice.

Mr. **Bloch**. Not quite.

Senator **Kerrey**. Well, not quite. You tell me. You're saying to me—I'm saying that Dr. Good has indicated that you get down to the end, and you have four that might be equal.

Mr. **Bloch**. Right.

Senator **Kerrey** [continuing]. I'm asking you, what are the other criteria? You say, well, that's what you get paid to do—make a decision. I understand you make a decision. But something in your mind enables you to make the decision. You say you can't roll the dice. I mean, is it drawn by lots?

Mr. **Bloch**. No; It's the program officer who makes that final decision. He or she has a good understanding of the subject matter, of all the proposals that are in contention, knows what that proposal does for the science, and in the end, you know only one can be funded, so he or she has to make that final kind of a call. It is based on what we term criterion 4—the impact on the infrastructure.

A lot of it's qualitative feel. I've no doubt about that and I've no reason not to say that.

Senator **D'Amato**. I've got a short one.

Senator **Kerrey**. That's what I heard. Go ahead. You're up. The Senator from New York.

Senator **D'Amato**. Mr. Chairman, thank you very much.

Mr. Bloch, it's good to see you. I'm going to ask that my full statement be introduced in the record, as if read in its entirety.

[The statement follows:]

Statement of Senator D'Amato

Madam Chair, I am pleased to join you this morning in welcoming our good friend, Erich Bloch, to testify before us on the fiscal year 1991 budget request for the National Science Foundation.

I want to commend Mr. Bloch for his leadership at the Foundation over the past several years. His agency—by supporting research in science and engineering, and the education of a technically skilled workforce—plays a vital role in advancing our Nation's economic competitiveness.

I note that the Foundation's request of $2.38 billion represents a 14% increase over last year. This funding level supports a revised plan that would double the Foundation's budget between fiscal years 1987 and 1995. I am pleased by the Foundation's continued commitment to growth in scientific education and research.

I am also encouraged by the strong emphasis on human resources development in the Foundation's budget request. At a time when the number of American students pursuing advanced science and engineering degrees is declining, we must do all we can to bring more young people into the science and engineering pipeline.

Finally, Madam Chair, let me commend the Foundation for continuing its strong support for university-based research and facilities. I am confident that the Foundation's balanced investment in university-based research and human resource development will pay large dividends in a more competitive economy.

Thank you, Madam Chair.

PIPELINE ISSUES

Senator **D'Amato**. Mr. Chairman, I have a question that gets into the area that I understand my colleague, Senator Grassley, touched on with respect to minorities, educational efforts, et cetera. I'm going to submit that for the record and ask if you wouldn't respond. Because I think these efforts are important, given the prominence you have given them, and the fact that we are going to be sorely lacking as it relates to women and minorities in the sciences, I look forward to hearing from you about what we can and should be doing. Particularly as we become a society more technically innovative, with a need for people who have sufficient backgrounds in the way of education, resources, et cetera, those efforts become paramount if we're going to compete?

But I'm going to ask—it gets a little technical—if you wouldn't respond. I'd be deeply appreciative.

Mr. BLOCH. Be glad to do that.

EARTHQUAKE ENGINEERING CENTER AT UNIVERSITY OF BUFFALO

Senator D'AMATO. Mr. Chairman, the Foundation budget includes $14.3 million for earthquake hazard mitigation. The importance of developing a basic engineering understanding of earthquakes and other national hazards was underscored in the disaster last October in the Loma Prieta earthquake.

Could you describe, Mr. Bloch, the role of the National Center for Earthquake Engineering Research at the University of Buffalo in improving our understanding of earthquakes, and how to reduce their damaging effects—let me continue. How committed is the Foundation to the center's continued support?

Mr. BLOCH. As you know, we established that center about 3½ years ago. The center came out of a competition. One of the competitions that Senator Kerrey talked about.

Senator D'AMATO. Don't I know.

Mr. BLOCH. We all remember that.

Senator KERREY. Are we going to learn about these other considerations here between you two?

Senator D'AMATO. I'd be glad to speak to the chairman postsession.

Mr. BLOCH. It's a center built on excellence, relevance [laughter] and all the other things I went through. The center has done very well. It has just had a 3-year review.

Senator D'AMATO. That's right. Last year you had your third-year review.

Mr. BLOCH. Correct. That resulted in funding the center for the remaining 2 years of the 5-year original grant that we had.

The reason for the center's establishment in the first place, was to pull together researchers from many disciplines to look at this issue of earthquake research, mitigation, and so forth; to provide a basis for education to undergraduates and to graduate students and to have a source and a center where information can be distributed, through the civilian agencies of the States, as well as through the academic community. I think it has fulfilled all of these purposes well. We are committed to see it through the 5-year process.

Senator D'AMATO. Well, I'm delighted that the review has sustained the Foundation's initial finding and, Mr. Chairman, I indicated that I would keep my remarks short. I certainly would appreciate it, Mr. Bloch, if you could respond to these questions with respect to underrepresented groups and what you're going to be doing.

Mr. BLOCH. I'll be glad to do that.

Senator D'AMATO. Thank you, Mr. Chairman.

Senator KERREY. You're welcome.

SCIENCE EDUCATION

Mr. Bloch, we've got about 3,500 days or so left before the start of the third millennium. The President indicates that he wants the United States graduating high school seniors at that point to be No. 1 in the world, in math and science. How are we doing?

Mr. BLOCH. First of all, let me say I think that's an important goal. I'm glad that the President put that out as a goal of his administration, and, hopefully, all of the subsequent administrations.

How well are we doing? We're not doing as well as we should, very clearly. We are not the leaders in science and mathematics education in the precollege area. In fact, for students in the fifth grade, we are in the middle of the pack, compared to other countries.

In the ninth grade, in mathematics, we are at the lowest possible level. That's not good. That goal is very important and we need to work on that one and make sure that we all pitch in and make that happen.

PRESIDENTIAL DIRECTIVE

Senator KERREY. What sort of directive did the President give you to mobilize NSF's resources toward that goal?

Mr. BLOCH. What you see in the budget here reflects that directive.

We just announced a couple of days ago an initiative, in precollege education, that involves NSF and the States, on a State-by-State basis, where we are asking the States to come in and look at their total precollege education system and see which areas need improvement and what we can do jointly. The States are involving the private sector in that particular State—the teachers' associations, parents, and so forth, and come forward with some proposals.

That's our first step, besides everything else that we had going when this goal of the President was announced. I think we are the leaders in the administration in the science and mathematics education area.

Senator KERREY. You're saying the NSF has been tasked for taking the leadership by the President?

Mr. BLOCH. No; I think we have taken the task on ourselves.

Senator KERREY. Has the President given you, at NSF, a directive to engage in a certain way the objective? Because I mean, with all due respect, what I hear you saying in response to my question is, if I decided I wanted to look like Arnold Schwartzeneggar by the year 2000, and you say what have you done so far, I'd say well, I've called a couple of people in to talk to me about it.

Mr. BLOCH. Oh, we——

Senator KERREY. I mean what's the effort? It seems to me, if you and I were going to sit privately and describe the problem, we know what the problem is. But I think the effort is woefully inadequate to the task.

Mr. BLOCH. Don't forget that we have, over the last few years, quadrupled our effort in this.

Senator KERREY. Oh, please. I mean, you can quadruple it; you can quintuple it; you can sextuple it. You can do whatever you want to but the fact of the matter is that we're 17th out of 17 industrial nations in math and science.

I mean, the fact is, you believe that the objective is a worthy one and it's critical to the economy of the United States of America in the year 2000, then we're treading water.

Mr. BLOCH. Do you think that NSF can do that by itself? It needs the cooperation of the States. We can be a catalyst; we can be a leader. A lot of the work has to go on at the grass roots.

Senator KERREY. In essence, the President has not given you the directive to engage, in any extraordinary way, the objective of trying to be No. 1 in the world in math and science?

Mr. BLOCH. I don't know how he would do that except saying, we want to be first, which he did. We want to be first. We know that we are playing an important role—the most important role in science and mathematics education.

Senator KERREY. What do you mean, you don't know how he would do that. When you say you don't know how he would do that, are you saying there's nothing further that the President could do to assist you in accomplishing that?

WILLIAMSBURG CONFERENCE

Mr. BLOCH. Sure; by exactly what he did. He had a conference down in Williamsburg with the States. I think it was a very productive conference, marshalling all the resources of the country; that's very important. We can't do that on our own; only he can do that.

Senator KERREY. Well, with all due respect, I think it's going to produce terrific sound bites, great stuff for campaign brochures, and maybe even get the President elected. But we'll be 17th out of 17 industrial nations in 1992. It will be 17th out of 17 industrial nations in 1996.

We may have quintupled, quadrupled—whatever you want to say with your budget. You'll be sitting in front of a Committee saying we did this, this and this. But I don't see a marshalling of the resources, as you've described. I mean, I don't think Williamsburg was a marshalling of this Nation's resources.

It was a marshalling of this Nation's political leaders to describe some goals. Now I accept the goals. The question is, What am I going to do to get from point A to point A? I've got 3,500 days left. It's a fairly finite number. I've got 16,000 school districts out there. I've got school teachers teaching six periods of math and science a day, 52 minutes. I've got kids coming into school that aren't prepared. I've got 5 percent of my graduating seniors with a capacity to do multiple step mathematics.

I mean, this isn't something that's that difficult to figure out. I mean you either believe it's a crisis and direct the NSF to develop a plan to deal with that crisis or all it seems to me that we're doing is putting a little salve on it.

Mr. BLOCH. I think more is being done than you are acknowledging. I think the awareness of the problem is certainly here. That was not true 7 or 8 years ago, when our education programs, especially our precollege education programs were completely wiped out.

Senator **Kerrey**. Well——

Mr. **Bloch**. So I think we have made tremendous progress.

Senator **Kerrey**. Seven years and now we know there's a problem.

Mr. **Bloch**. No; I think you're misinterpreting what I'm saying. I'm saying, we have started to build up our efforts over the last 6, 7 years. We can be proud of the effort that we have made. You haven't seen the results yet in every school district in the country. That's absolutely true. I don't think you can expect to see that in 5 to 6 years.

We talked about that before you came in here. I think you have to have some patience. How do you change something like that overnight?

Senator **Kerrey**. I disagree. I think we need to have considerably more impatience, and a considerably greater sense of urgency if we're going to hit that objective.

Mr. **Bloch**. I think——

Senator **Kerrey**. It isn't going to happen.

Mr. **Bloch** [continuing]. We have the sense of urgency.

Senator **Kerrey**. I think that the proposals that you made will not enable us to accomplish the objective. They will enable us to go back home and say we're spending more; we're aware of the problem; we're marshalling our resources. I mean, I know how to go 30-second television ads. I know how to shape my message. I can shape my message to look like I'm solving the problem.

The fact of the matter is I know I'm not. The fact of the matter is I know that I'm not participating in a broad-based, organized effort to take the United States of America to January 1 of the year 2000 as No. 1 in the world. I'm not participating in that effort.

COOPERATIVE EFFORT NEEDED

Mr. **Bloch**. But look, Senator, first of all, neither the President nor the Federal Government nor the National Science Foundation can solve this problem by itself. I think you will agree with that.

Senator **Kerrey**. I absolutely agree.

Mr. **Bloch**. OK. So we need to work together on it— all the various agencies, people, and localities that are involved in the educational process. I think setting a goal was very important for the President to do and he did it, OK? He shouldn't determine how it's going to be implemented. We all need to determine that together.

Senator **Kerrey**. The President also said at Williamsburg that the American people are ready for radical changes in American education, and we should give it to them. This is not radical change. This is essentially saying, we're going to spend a little more, now that we're aware of the problem, and look for some ways to enable people like me to go home and say, we're working on this thing.

Mr. **Bloch**. Look, we can only present to people some of these radical changes, and give them an impetus to make these radical changes. You know quite well these changes have to be made at the bottom, in every locality, in every school district, in every school. That's where the changes have to occur. You can't dictate it from the top.

Senator **Kerrey**. Why not say——

Mr. **Bloch**. We can show the way.

Senator **Kerrey**. Why don't you say to people in higher education, look, you all are coming in here and getting grants up the wazoo. But what kind of condition are your kids coming into your postsecondary institutions?

Mr. **Bloch**. Don't think for a minute we haven't done that.

Let me tell you one thing.

Senator **Kerrey**. I'll just again make this representation. The year 1992 is going to arrive; the year 1996 is going to arrive; the year 2000 is going to arrive. We'll still be 17th in the world's industrial nations in math and science with this kind of an effort.

Mr. **Bloch**. What kind of an effort do you think would satisfy—what kind of an effort is needed?

Senator **Kerrey**. One that can be identified as America's No. 1 problem for science and math.

Mr. **Bloch**. I think it's identified as the No. 1 problem. It certainly is identified by us.

Senator **Kerrey**. Mr. Bloch, not if the President hasn't given you a directive of some kind, indicating that he wants the resources of NSF to be focused upon this as our No. 1 problem.

Mr. **Bloch**. The budget was approved by him; that's a directive. You see what we are proposing in the budget.

Senator **Kerrey**. OK.

Well, we have a disagreement, you and I. That ought to be readily apparent to you. I mean, I assume there's no misunderstanding on that.

Mr. **Bloch**. I'm sure.

NO. 1 PROBLEM

Senator **Kerrey**. I see a problem of much greater magnitude than this proposal addresses. I understand that it's—we've got 16,000 school districts. I understand that they're the ones making the decision. I understand you've got school boards out there, trying to make determinations of the curriculum, trying to make evaluations of—I understand all that. I don't see NSF engaging it as America's No. 1 problem.

Mr. **Bloch**. Well, I certainly disagree with you on that last statement. I think we have recognized it as our No. 1 problem. We have acted accordingly. We are involving exactly what he said we should involve—the universities and the research communities in this particular problem in many different ways.

Senator **Kerrey**. You—NSF has identified being No. 1 in the world in the year 2000 as its No. 1 priority, in math and science, for 17-year-olds?

Mr. **Bloch**. In math and science education, definitely.

Senator **Kerrey**. That's NSF's No. 1 priority, above all other priorities?

Mr. **Bloch**. Above all other priorities. Our budget shows that. Look where the big increases are. They are exactly in the area of education and human resources, in the precollege area as well as in the whole pipeline, as Chairman Mikulski mentioned, before. That's where our priorities and our big increases are.

Senator **Kerrey**. Well, I will make the case at length and on a continuing basis.

Mr. **Bloch**. I'm sure you will, and so will I.

Senator **Kerrey**. By the way, you know, to make my case even further, you don't, in your budget, lay out for us the problem that we're currently addressing. It does not seem to me that you identify it anywhere nearly like you ought to.

You're saying it's NSF's No. 1 priority. But you don't come—it seems to me, to the committee or come individually and say, Senator, I need your help; we've got a real crisis out here. The President's talked to me about this; he's established in Williamsburg as the No. 1 objective, and we need your help. We know that you've been involved at the State level on this thing before. We know you've got some working knowledge of this. What are your ideas; how can we make this work?

There's none of that going on. There's none of that going on at all. It seems to me, unless it goes on, all we're doing is—as I said before, it seems to me we're going to do some marginal things and we're all going to look good on television.

Mr. **Bloch**. No. Just on your last point, if I may say one more thing.

We have talked to the National Governors Association exactly about that issue. They were with us the other day on the announcement of the statewide initiatives that we put in place. So you can't say that we haven't talked to the States. We have.

Senator **Kerrey**. OK.

ADDITIONAL COMMITTEE QUESTIONS

We will submit the balance of the questions for response in the record.

[The following questions were not asked at the hearing, but were submitted to the Foundation for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR MIKULSKI

APPROPRIATE "MIX" BETWEEN CIVILIAN R&D DISCIPLINES

SENATOR MIKULSKI: What statistical evidence do you have that supports your conclusion that we have lost ground economically over the last four decades because we've put more in life sciences than in the physical sciences?

ANSWER: The body of literature on the economic impact of R&D clearly supports the conclusion that national productivity is significantly affected by R&D. One of the most important factors that leads to a strong economy is the productivity of the manufacturing process. (This conclusion is supported by the authors of the much circulated report The Japan that can say "No".) In this area, physical sciences and engineering have a more substantial influence than the life sciences.

According to a report published by BLS, The Impact of Research and Development on Productivity Growth, R&D has directly contributed 0.2 or 0.3 percent annually to productivity since 1948. Also, studies which include the indirect effects of R&D on improved capital or materials quality suggest larger magnitudes may be involved. The BLS report also shows, however, that virtually all of the increase in productivity since 1948 stemming from R&D has occurred in the manufacturing sector. R&D in manufacturing has grown about 6.6 percent annually since 1948. The life sciences account for only about 15 percent of the basic research in industry. The rest is in non-life sciences and engineering. We believe, therefore, that the industry R&D resulting in manufacturing process improvement and improvements in capital and materials resulting in higher productivity, comes from the physical sciences and engineering.

SENATOR MIKULSKI: Where is the Bush Administration on this thesis: do they agree with you, and how does the 1991 budget stack up on this subject?

ANSWER: The President's FY 1991 budget is a statement of a balanced set of priorities for the federal role in the support of R&D. As such, it reveals that the Administration is seeking to move the balance of R&D for basic research into the civilian sector by proposing such initiatives as doubling of the NSF budget, supporting global change research, and basic R&D for advanced technologies. The President's FY 1991 budget stacks up well on this subject, proposing an increase of nearly $4.5 billion for R&D.

SENATOR MIKULSKI: Aren't comparisons of this sort more likely to set off a certain amount of "family feuding" between yourselves and your colleagues at NIH? Will we see OSTP leadership in this area?

ANSWER: No feuding is likely because the relative increases proposed for both NSF and NIH in FY 1991 are significant. The issue is used to focus attention on areas where we are clearly in the forefront such as biotechnology research, versus other areas, supported by physical sciences and engineering basic research, where we are in danger of losing our technological advantage.

OSTP leadership in the President's R&D budget is already being felt. The Council of Advisors is in place, various FCCSET committees are gearing up, and Dr. Bromley's testimony this year has been reflective of the President's priorities.

NSF's EMPHASIS FOR FY 1991

SENATOR MIKULSKI: What will it cost in dollars to fill and maintain the science personnel "pipeline" flow and the research infrastructure (equipment, facilities, and laboratories), and is this budget enough and in time?

ANSWER: The declining S&E personnel pipeline is not a problem that can be solved exclusively by NSF, nor should it be. It is a national problem resulting from reduced birth rates, the changing racial and ethnic composition of students, and the mixed effectiveness of primary and secondary school teaching of science and mathematics.

In response to the issue of filling the S&E pipeline, the issue is not one of finding the personnel, but rather it is one of attracting students into S&E fields and retaining them once they are enrolled. The average number of students in school in any pre-college grade has been about 4,000,000. Improving the attraction of science and engineering to even a very small percentage of any of these students will produce more than enough future scientists and engineers.

The President's budget presents the best compromise between fully funding our long term needs and staying within the funding limits set forth in the Gramm-Rudman-Hollings Law. The Budget takes initial strong steps towards the long-term commitment and stability necessary to develop the S&E research enterprise, including personnel, facilities and instrumentation, by doubling the NSF budget for programs to maintain the "pipeline" by 1993.

SENATOR MIKULSKI: What are current needs of NSF center facilities (including aircraft, ships, and other research platforms) to maintain them in a safe operating condition? Does the FY-1991 budget do that?

ANSWER: Center budgets are contracts or cooperative agreements and we are able to ensure that NSF facilities are maintained in a safe operating condition. Safety is accorded the highest priority, and safety inspections are carried out on a regular basis. We demand routine and aperiodic maintenance activities, testing programs, training of personnel, and compliance with OSHA requirements. Support is provided for these activities to the National Astronomy Centers, the National Center for Atmospheric Research, the Upper Atmosphere Incoherent Scatter Radar Facilities, the U.S. Academic Research Fleet, and facilities of the U.S. Antarctic Research Program.

SENATOR MIKULSKI: How is NSF combating costs to young professors who seek access to NSF's facilities and centers of excellence such as NCAR?

ANSWER: NSF supported facilities and centers are available without user costs to scientists and engineers who are pursuing NSF sponsored research. This includes access to NCAR, the Academic Research Fleet, the Astronomy Centers, and the U.S. Antarctic Program. The development of networks such as NSFNET facilitates access to the NSF supercomputer centers and NCAR. NCAR has an active visitor program that provides support to researchers who plan to spend time there working independently or in collaboration with NCAR scientists.

COORDINATION OF FEDERAL SCIENCE EDUCATION EFFORTS

SENATOR MIKULSKI: Has the interagency coordination of science education improved since last year? Please explain your answer.

ANSWER: Both formal and informal efforts to improve coordination of Federal science education activities are being made. Among the formal, one would list the hearings before committees of the Congress, e.g. those in March 1990 before the House Committee on Space, Science, and Technology; and the work of the President's Science Adviser, Dr. D. Allan Bromley, to develop a committee responsible for interagency coordination.

Among the informal efforts are the continuing interactions of NSF officers with their counterparts in other agencies. The Director of NSF has met several times this year with the Secretary for Education, Dr. Lauro Cavazos, to explore common interests and specific areas of concern; mutual interest, genuine concern, and sincere effort are leading to improved communication and better understanding and will, in time, yield more effective coordination of the activities of the Foundation and the Department. Both NSF and the Department have appointed liaisons for higher level attention. AT NSF this is Dr. Luther Williams, the Senior Science Advisor to the Director; at the Department of Education, it is the Under Secretary of Education, Mr. Ted Sanders.

The Department of Energy is the other agency with which the NSF has a relatively high level of interaction concerning science and mathematics education activities. For several years, each agency has had a designated representative and they maintain good communications. NSF has supported a number of specific Department of Energy projects.

In addition, OSTP recently submitted an OSTP-Department of Education-NSF generated report to the Senate that focussed on improving the coordination of NSF and Department of Education science, math and engineering education programs. A copy of the report is attached.

REPORT OF THE
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
TO THE
UNITED STATES SENATE APPROPRIATIONS COMMITTEE
MARCH 1, 1990

COORDINATION OF
U.S. DEPARTMENT OF EDUCATION
AND
NATIONAL SCIENCE FOUNDATION
PROGRAMS IN MATHEMATICS AND SCIENCE EDUCATION

SUMMARY

This report responds to language in the Senate Appropriations Committee report on the FY 1990 appropriation for the Office of Science and Technology Policy (OSTP) (Senate Report 101-128). The Committee expressed concern about the level of coordination between the Department of Education (DoEd) and the National Science Foundation (NSF) to improve mathematics, science, and engineering education and requested that the OSTP "take immediate steps to improve any and all coordination problems between the two agencies...." This report describes the progress that has been made in improving coordination between the Department of Education and the National Science Foundation on programs relating to mathematics, science, and engineering education. The report also describes actions of the Director of OSTP to coordinate efforts of all Federal agencies which have substantial interests in mathematics, science, and engineering education.

To achieve the national goal for mathematics and science education, a strategy for (1) improving coordination in mathematics, science, and engineering education between DoEd and NSF in the immediate future, and (2) developing a coherent Federal effort in mathematics, science, and engineering education in the longer term, is being developed.

- A high level, visible formal coordinating mechanism has been agreed on and is being implemented between the DoEd and the NSF to deal with immediate issues and problems.

- OSTP is establishing a Federal coordinating committee to coordinate activities of all Federal agencies in mathematics and science education.

Introduction

Federal, national, State, and local efforts to reform mathematics and science education are coalescing to support the national goal for American students to be first among industrialized nations in mathematics and science achievement. This goal was articulated by the President in the State of the Union Message and by the Governors in their meetings this week in Washington. The Office of Science and Technology Policy (OSTP) is working directly with the leadership of the Department of Education (DoEd) and the National Science Foundation

and NSF have key leadership roles and significant budgets to lead the Federal effort in supporting the States and the localities as they exercise their responsibilities for education reform and improvement.

The OSTP, DoEd, and NSF agree that improved coordination between DoEd and NSF is desirable. Indeed, improved cooperation and coordination is essential to improving mathematics and science education. The latter two agencies have agreed to a strategic planning effort with a clear focus on student learning. Action resulting from that joint planning will assist States, local school districts, schools, and postsecondary education institutions to address major issues and to reform essential education system components related to achievement in mathematics, science, and engineering.

Coordinating the work of DoEd and NSF is an important first step in increasing the overall effectiveness and productivity of the Federal effort in improving mathematics, science, and engineering education in the nation. The magnitude of educational reform in the scientific and technical fields and the length of time needed for successful reform necessitate excellent coordination and collaboration among ALL Federal agencies with interests in science and technology. To that end, the Director of OSTP, as Chairman of the newly revitalized Federal Coordinating Council on Science, Engineering, and Technology (FCCSET), is taking action to create a FCCSET Committee to deal with human resources and education. The Committee will address significant national policy issues which cut across agency boundaries and will provide a formal mechanism for interagency policy coordination and exchanges of information regarding education and human resource development for science and technology. The Committee will be organized in time to coordinate the development of 1992 budget submissions by the agencies.

The Short Term: Formal Coordination Between the Department of Education and the National Science Foundation

The Secretary of Education (Lauro F. Cavazos) and the Director of the NSF (Erich Bloch) have established formal mechanisms for coordination of mathematics and science education programs between the two agencies. The Director of NSF appointed his Senior Science Advisor (Luther S. Williams) to chair the coordination effort for NSF. The Assistant Secretary for Educational Research and Improvement (Christopher T. Cross) has been charged with heading the coordination effort for DoEd. Coordination at all appropriate levels between DoEd and NSF is the continuing responsibility of these designated officials. These new coordination efforts replace present ad hoc coordination arrangements.

The formalization of coordination between DoEd and NSF will enable the agencies to plan strategically for an effective Federal effort in the achievement of the national goal in mathematics and science education. It will be possible for the agencies to develop joint programs which focus limited Federal funds on critical factors for improving mathematics, science, and engineering education. A more immediate action the agencies will undertake is strengthening the ties between existing programs which complement and support each other in the achievement of the national goal. Specifically, the DoEd and NSF have agreed that the following programs and activities will be coordinated initially under this new arrangement:

- distribution of NSF educational materials by the DoEd dissemination networks;
- research and development of educational technologies, teaching and learning strategies, and policy for mathematics and science education;
- programs to enhance national and international assessments of student learning in mathematics and science, studies of international comparisons of precollege mathematics and science education, and international mathematics and science educational achievement indices;
- cooperative support of State systems and urban districts to improve mathematics, science, and engineering education;

- programs for increasing participation and achievement of traditionally underrepresented groups in mathematics, science, and engineering education; and
- undergraduate level mathematics, science, and engineering education, including preparation of teachers and faculty.

Use of DoEd Dissemination Networks to Publicize NSF Projects

It is important that high quality materials and documentation of exemplary practices developed by either NSF, DoEd, or jointly by the two agencies reach State and local education agencies. DoEd has dissemination and distribution networks among schools and States, including the National Diffusion Network, the Regional Education Laboratories, the network of coordinators for the Eisenhower Act Mathematics and Science Education Programs, and the Urban Superintendents' Network. The precise mechanisms to be used to increase the flow of high quality projects funded by NSF into the DoEd's existing dissemination networks will be developed jointly by DoEd and NSF.

Research and Development of Educational Technologies, Teaching and Learning Strategies, and Policy for Mathematics and Science Education

The NSF, through its educational technology program, and the DoEd, via its National Educational Research and Development Centers and the Fund for the Improvement and Reform of Schools and Teaching (FIRST), are supporting significant efforts designed to provide technologies for hands-on science education experiences and improvement of higher order thinking skills, and novel approaches to mathematics and science learning and instruction. A coordinated research and development strategy will greatly leverage Federal expenditures.

Enhanced National and International Assessments of Student Learning in Mathematics and Science, Studies of International Comparisons of Precollege Mathematics and Science Education, and International Mathematics and Science Educational Achievement Indices

One of the most important post-summit/national education goal activities will be the development of appropriate national and international comparative assessments of student learning in mathematics, science, and related technical education. DoEd and NSF already have a strong track record of collaboration and joint funding in national and international assessments of student achievement. Both the DoEd and the NSF are currently funding mathematics and science education achievement indices and international comparisons of mathematics and science performance.

Under the new coordination arrangements, the DoEd and the NSF will establish mechanisms for increased collaboration in national assessments of student achievement in mathematics and science, possibly including co-funding of specific projects as appropriate. A major activity will be to coordinate the needed research, experimentation, and trials of appropriate performance, portfolio, and related assessments which measure authentic acquisition of knowledge, habits of mind, and skills related to mathematics and science.

Cooperative Support of State Systems and Urban Districts

The DoEd and the NSF will pursue cooperative support of State systems and urban districts to improve mathematics, science, and engineering education. Drawing on the resources of the Precollege Division of the Science and Engineering Education Directorate of NSF, and the Eisenhower Program of the

DoEd, explicit strategies will be developed for identification of high priority target uses for the funds made available to States and urban districts through the Eisenhower program and those funds granted to States by NSF to promote systemic change in mathematics and science education. Support for systemic change is also available from the mathematics and science research centers and regional laboratories operated by the DoEd's Office of Educational Research and Improvement, and from the Urban Superintendents Network.

Underrepresented Groups in Mathematics, Science, and Engineering

[illegible] improve mathematics, science, engineering, and technology education for traditionally underrepresented groups. Under the Comprehensive Regional Centers for Minorities in Science and Engineering of the NSF and the Minority Science and Engineering Programs of DoEd, mechanisms will be established to ensure that collaborative efforts serve to leverage the resources committed by each agency, increase the probability of synergistic cooperation, and minimize program duplication.

Programs to Improve Coordination in Undergraduate Education in Mathematics and Science, Including the Preparation of Teachers

For an increased undergraduate mathematics, science, and engineering education effort, mechanisms will be established for co-funding of projects by the DoEd Fund for the Improvement of Postsecondary Education (FIPSE) and the Division of Undergraduate Science, Mathematics, and Engineering Education of NSF. Programs will build on DoEd's and NSF's current work in this area. For example, support for Historically Black Colleges and Universities (HBCU) is a common goal of both DoEd and NSF. Strong coordination will be developed between the DoEd programs supporting research skills among faculty and upper level undergraduate students and the NSF undergraduate programs.

Study of Possible Impediments to Coordination

Both DoEd and NSF operate their programs under legislation that presumes that each has a primary responsibility for mathematics and science education. Both agencies agree that this can result in operating problems, problems working with the States, and even very real perceptions, at some levels, of actual barriers to coordinating and integrating programs. Both agencies agree that a major aspect of their renewed commitment to cooperation will be the joint review of legislation and program regulations to identify specific problem areas and to propose solutions.

The Long Term: Federal Coordinating Council on Science, Engineering, and Technology

The specific activities the DoEd and NSF will coordinate in the immediate future, described above, should be understood in the context of the larger effort to coordinate activities across the government. Recognizing the need for coordination among all Federal agencies with mathematics and science education programs, the Director of OSTP, as Chairman of the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET), is taking steps to create a FCCSET Committee to deal with human resources and education. The Committee will be [illegible] in time to coordinate the development of the [illegible] budget submissions by the agencies.

This FCCSET Committee will include senior policy-level officials from DoEd and NSF, as well as from other Federal agencies with programs related to education and human resource development in science and technology. The Committee's work will promote more efficient use of expertise in the agencies, reduce program overlap, identify areas of program need, and make more efficient use of limited Federal resources. The objective of this new FCCSET Committee is to develop a truly integrated inter-agency effort in:

- strengthening mathematics, science, engineering, and technology education at all levels; and

- developing and maintaining a technologically and scientifically literate workforce to keep the nation competitive in global markets.

The new and revitalized FCCSET structure will benefit from the work of the President's Council of Advisors on Science and Technology (PCAST). The purpose of PCAST and its ad hoc panels of private sector executives, researchers, and academics is to advise the President on matters involving science and technology. The President's Science Advisor, as Chairman of both PCAST and FCCSET, will ensure that the FCCSET Committee receives the advice and recommendations of experts outside of government. Because education and human resources are issues that necessitate both public and private sector action, and cut across Federal, State, and local boundaries, the issues will be most effectively addressed by the FCCSET when it has access to the best private sector advice available.

SENATOR MIKULSKI: Are you concerned that the Secretary of Energy whose agency has only a small level of science education activity, was picked to head the Administration's coordination of science eduction activities?

ANSWER: No. Admiral Watkins is a strong supporter of efforts to improve science, mathematics, and engineering education at all levels. His conversance with the predicaments of education and the needs of the nation is of a very high order. In his public statements concerning the role of his agency and the opportunities and responsibilities facing the federal government, he has been a spokesman for quality, for vigorous action, and for strong partnerships among agencies and between federal and state governments. The Foundation welcomes his leadership.

SENATOR MIKULSKI: Does this mean that Energy, and not NSF, is the lead federal agency on math and science education?

ANSWER: No. That the head of a particular agency is designated to chair a body charged to coordinate the activities of many agencies in a given action area does not imply that his agency is the lead agency in that area.

SENATOR MIKULSKI: How does the Administration plan to make this more complex arrangement work?

ANSWER: The new coordinating structure has not developed operating procedures, so one cannot yet state how the arrangement will work. The various agencies concerned with mathematics and science education recognize the benefits of joint and common action and the need for coordination of their activities. The new committee promises improved coordination and more effective programming.

PLAN TO IMPROVE "PIPELINE" AND INFRASTRUCTURE

SENATOR MIKULSKI: For 1994, how many students should be in the pipeline at various points, and what is your 1994 goal for the number of scientists, engineers, and technicians entering civilian science sectors?

ANSWER: Both the "pipeline" and "infrastructure" problems are national issues, not ones to be solved by the Federal Government or NSF alone. However, it is possible to set out some rough guideposts.

Assuming that demand for natural scientists and engineers (NS&E) will remain at the 1986 level -- contradicting both historical uptrends and labor force requirements projected in BLS's Projections 2000-- and that the current percentages of students entering S&E fields does not increase, the cumulative shortfall of new NS&E bachelors will be in the neighborhood of 250,000 by 1994. NSF's goal is to reduce this shortfall by as much as possible.

It is reassuring that very large gains could be made in the production of bachelors level scientists and engineers by improving the retention of capable high school graduates who have the necessary course preparation to succeed in these fields. If all such students selected NS&E study programs in college, the number of NS&E B.S. degrees would increase by 25%. Additionally, if B.S. completion rates of women and minorities who have already selected NS&E majors could be brought up to those of majority men, another 15% increase would result. Both of these taken together would solve the pipeline problem.

SENATOR MIKULSKI: When should we begin to see results? What is your timetable and success measures for solving the "pipeline" and research infrastructure problems?

ANSWER: NSF has begun to take steps through a series of actions designed to impact the science and engineering pipeline at critical stages. Our first set of priorities in the mid-eighties was to put in place pre-college science and math programs for teachers and students.

Then in the late 1980's a set of undergraduate programs was begun that was designed to enhance student research experiences, reinvigorate undergraduate faculty, put in place new curriculum, and modernize instructional laboratories. More recently special programs and activities have been designed to attract and retain women and minorities to science and engineering careers.

Because the typical student requires 10 to 12 years to move from pre-college through a PhD level, the results of these programs must be monitored over long periods of time. It should be noted that NSF's SEE budget was zeroed out in 1982, and the programs have been rebuilt since that time or have recently been initiated. NSF is attempting to monitor the results of these programs, however the actual impact of these programs will not be realized for several years. In the meantime, NSF is continuing to develop its portfolio of science and math education activities to maximize the impact of its budget on the $105 billion annually spent on education in the US.

The infrastructure issue has been the subject of much serious discussion and analysis among leaders of academe, industry, and government. The Government-University-Industry Research Roundtable, sponsored by the National Academies, recently issued a comprehensive report, Academic Research Facilities: Financing Strategies.

Existing problems need to be addressed, but neither a single solution nor a single source of funds are adequate to the task, and national budget realities impose limits on Federal initiatives. The NSF for its part maintains many national facilities, permits funds for facilities to be requested as part of an application for research support, and is conducting the Academic Research Facilities Modernization Program as put forth in the 1988 Authorization Act.

SENATOR MIKULSKI: What are your goals and annual success measures for attaining total inventory value and replacement rates of research equipment, laboratory facilities, aircraft, and ships for universities and NSF centers.

ANSWER: Each program area plans for future improvements, upgrades, and replacements of its facilities. The NSF regularly tracks its major program items for capital needs as well as operations and maintenance. NSF also maintains an inventory of its land, buildings and research equipment.

The major contractors to NSF (including the Astronomy centers, NCAR, the ship operating institutions, antarctic operations, and the various centers) usually receive, after review of their proposals, a multi-year award that includes recommended funding levels for operation, maintenance, and capital requirements. Each year the funding levels are negotiated for each item, including capital equipment, upgrades and replacements. Cooperative agreement levels are met whenever possible, although award amounts are subject to the availability of funds.

For example, the University-National Oceanographic Laboratory System (UNOLS) has been planning for ship replacements for the past several years. NCAR has been planning for supercomputer upgrades and research aircraft replacement as well. The National Astronomy Centers plan for necessary upgrades, upgrades or replacements, e.g. the Arecibo upgrade proposed within the FY 1991 budget request.

NSF MANAGEMENT OF THE "PIPELINE"

SENATOR MIKULSKI: In response to the recommendation in the OTA report (June 1988) on educating scientists and engineers, is NSF adding educators to its staff to work with scientists in educating primary and secondary grade students?

ANSWER: The OTA report recommended, in part:

> "Require NSF to employ more staff experienced in the practice of elementary and secondary education in schools, school districts, and Sate education agencies, rather than those recruited from research environments in higher education."

The Science and Engineering Education Directorate has on staff expertise in the scientific disciplines (physics, chemistry, biology, etc.) and expertise in science education at all educational levels, e.g. - a former elementary science teacher, a high school physics teacher, a former principal of the NC School of Science and Mathematics, and a former state supervisor of science instruction.

IDENTIFYING LEAKS IN "PIPELINE"

SENATOR MIKULSKI: Where do the students drop out of the "pipeline" and why?

ANSWER: The pipeline leaks at every stage, but two points stand out with great clarity. By the time students reach their sophomore year in high school, over 80% of those students no longer have an interest in science. The major leak in the pipeline has already occurred by this time. For this reason NSF programs emphasize the need to address this problem in the elementary and middle schools.

The second significant leak is the single year between the high-school senior and the college freshman. Over 40% of interested high-school seniors have dropped out of the pipeline by the end of their freshman year in college. NSF is addressing this leakage by supporting projects to revamp introductory curriculum at the undergraduate level. We are also attempting to modify a long-standing philosophy of college faculty "weeding out" the freshman class. Obviously, the country needs to adopt a philosophy of "nurturing" young students, rather than weeding them out of an ever-shrinking pipeline.

SENATOR MIKULSKI: Why do kids and young adults decide to pursue careers as scientists and engineers? (Perhaps excitement of discovery?)

ANSWER: The following points are relevant to this question:

(1) Certain **prerequisite conditions** are needed before a young person can decide to pursue a career as a scientist. The person needs to be in school (not a drop-out), be succeeding in science and math courses, and have prospects of pursuing higher education. These preconditions are particularly important to keep in mind when addressing the question of how to involve more minority students in science careers.

(2) **Early interventions** are important. Reports indicate that children who have preschool experience need less educational help, have a better attitude toward school, and are more likely than their peers to persist through high-school graduation. In the 1986 National Assessment, well over half of children by grade 7 thought that science would NOT be important to them in their life's work. Positive attitudes towards science decline as students progress through school.

(3) **Expectations** of family, teachers, school, community and society are important influences. Some studies report that minority children receive less encouragement from their teachers for the idea of pursuing higher education. Some studies show that boys receive preferential attention and feedback from teachers in the science classroom. The manipulative toys often given preferentially to boys encourage mechanical reasoning and spatial awareness. Sex role socialization is believed to contribute to lower participation of girls in science careers. Parent involvement in school activities affects student achievement.

(4) **Self-esteem and success** are important factors. If girls are exposed to math and science early, in a demystified, fun way, they will be more likely to continue studying math and science in high school and college. High school is too late to begin building the self esteem. Setting high standards in high school for children already far behind is unproductive.

(5) **Role models** of successful scientists pursuing desirable lifestyles are important. Life style of careers is especially important as a decision factor to women. Career exploration activities can increase the proportion of women who decide to pursue a science related career in college. Minority students who persisted in science through college reported that summer jobs and part-time work, especially with minority scientists and engineers, influenced them more than parents,

friends and teachers did, although these figures were still important.

(6) **Participation** in doing science affects in a positive way young peoples' ideas about what science is and what scientists are like.

Students who work on real problems, gather and analyze their own data, and collaborate and talk with others about their work change their image of what science is about.

(7) Participation in advanced high school math and science courses and related extracurricular activities distinguished minority students who persisted in science from other groups.

(8) For students to persist in math and science in college, the quality of their first-year college math and science courses is critical.

SENATOR MIKULSKI: What will you propose to assist federal and state mission agencies in getting capable scientists and engineers? Is it mainly a matter of money?

ANSWER: Federal and state mission agencies must take a long-term view of their mission and allocate resources to develop the human resource pool in areas related to their mission. Often they have access to unique S&E resources and facilities which could be effectively used to excite and train future S&Es. It is not only a matter of money. It is a matter of changing attitudes, values, and broadening the objectives and goals of Federal and state mission agencies to include the development of their future S&E workforce.

SENATOR MIKULSKI: To what degree does a NSF fellowship for a graduate student meet basic needs for food, shelter, clothing, health care, books, and tuition and other university fees? Are there substantial geographical differences? Please explain.

ANSWER: The annual stipend of $12,900 for the 1990-1991 academic year (increasing to $13,500 for 1991-1992) is comparable to stipends paid under other similar fellowships. The level is minimal for food, shelter, and clothing and does not provide explicitly for health care or books. The student does not see charges for tuition or fees charged other students of similar standing; each U.S. institution attended is provided a cost of education allowance of $6,000 in lieu of tuition and fees.

The stipend rate is the same for all geographical locations, thus students might be affected by different costs of living rates.

SENATOR MIKULSKI: Are the salaries of technicians, scientists, and engineers sufficiently competitive with other professions to encourage students to complete degrees in science and seek employment in their fields of training?

ANSWER: No. Income potential for medical specialties, attorneys, and business fields (MBA'S) is generally much higher immediately upon graduation than it is for a Ph.D. scientist and engineer.

SENATOR MIKULSKI: Does government policy directly or indirectly set limits on salaries of scientists in government and in private sectors of the workforce?

ANSWER: Scientists and Engineers (S&E) salaries are driven, in large part, by the competitive (private) sector; they are constrained in the government by Federal policies limiting pay. NSF has consistently urged investment by mission agencies in their personnel and infrastructure areas including supporting fellowships for targeted research disciplines and acquiring instrumentation and equipment, including maintenance and operations costs, etc.

Government policy sets limits on the salaries of scientists and engineers both directly and indirectly. The government directly sets the salaries of S&E's it employs, and these salaries are significantly below those of the private sector. Salaries for S&E at universities are indirectly set by the government because in order to receive an NSF grant, the PI's salary may not exceed the government rates.

SENATOR MIKULSKI: What is the role of the Office of Personnel Management's position classification guides and other policies on the total workforce salaries?

ANSWER: The Federal classification system, created by the Classification Act of 1949, establishes government standards that apply to most positions in the Federal Government. Application of those standards results in grade, pay and qualifications determinations for each position. OPM establishes broad policy and sets limits on the amount of money that can be paid to employees for performance and incentive awards.

SENATOR MIKULSKI: If technical and science professionals' salaries are too low to encourage entry into the workforce, what can the Federal government, including NSF and mission agencies, do to make them competitive?

ANSWER: As an employer, the Federal Government can set pay polices to become a more competitive employer, as some new bills seek to do.

Government policy should stimulate entrepreneurial endeavors undertaken by scientists and engineers and encourage business formation and development of new products and technologies.

INFORMAL EDUCATION

SENATOR MIKULSKI: What is the goal of the Informal Science Education Program (ISE)?

ANSWER: The goal of this program is to provide support for projects that strengthen and enhance the scientific and technical understanding of the public outside of the formal education environment. Most people learn much of what they know about science, engineering, and technology outside of school. The program seeks to encourage a rich environment for recreational learning, where both children and adults can acquire a substantial measure of science literacy and awareness while satisfying a natural curiosity. Informal learning activities support the science presented in formal educational settings and stimulate a lifelong interest in science.

ISE supports activities which include:

- science programs broadcast by television or radio, which reach large and varied audiences;
- museum exhibitions, both permanent and travelling, that provide direct involvement and "hands-on" experience with science and technology;
- recreational learning activities that encourage interaction with the resources and staff of museums, science-technology centers, nature centers, zoos, aquaria and planetaria; and

- innovative science programs and projects by organizations and clubs, which reach significant target audiences and provide recreational opportunities to learn about science and technology.

SENATOR MIKULSKI: Will the Informal Science Education Program (ISE) improve the image of scientists and engineers?

ANSWER: ISE has supported a variety of media presentations, exhibits, and other activities which have presented positive images of scientists engaged in their work. Some examples of recent projects include:

- The Children's Television Workshop has presented seven seasons of the program "3-2-1 Contact", which presents elementary school students with scientists interacting with the young cast in many research settings.
- The "My Daughter the Scientist" exhibit, which was developed by the Chicago Museum of Science and Industry and has been on display at science centers across the nation, presented "hands-on" introductions to the significant achievements of many female scientists, engineers, and inventors.
- The film "Stand and Deliver" demonstrated, through the example of Jaime Escalante and his students, that minority students can become high achievers in mathematics.

SENATOR MIKULSKI: Will the Informal Science Education Program (ISE) build bonds among students, science teachers, scientists, and engineers?

ANSWER: ISE seeks to support programs which link students and teachers with research scientists. Such links are made indirectly through the many media programs, sponsored by ISE, and directly through many of the museum exhibits supported by ISE which have been developed through active partnerships of museum staff, scientists, and teachers. One current project, "Science By Mail" developed by the Boston Museum of Science and active in many science museums and schools across the nation, links students, teachers, scientists, and engineers together through active correspondence.

SENATOR MIKULSKI: Will programs supported by the Informal Science Education Program (ISE) show kids how to do experiments and to test assumptions?

ANSWER: The general thrust of ISE is to encourage active engagement with the scientific method through the support of "hands-on" exhibits and other activities which challenge children to test their assumptions against reality. Museum exhibits provide such opportunities for children and adults of all ages. Recent "hands-on" exhibits supported by ISE range from the Boston Children's Museum's "Raceways" and "Bubbles" exhibits, for preschool and elementary-aged children, to an exhibit on particle physics at the New York Hall of Science. ISE also supports recreational science activities through the Girls' Club, 4-H, and other youth-serving organizations.

SENATOR MIKULSKI: Will programs sponsored by the Informal Science Education Program (ISE) ignite the interests of kids in science and engineering?

ANSWER: One measure of the interest of children and adults in ISE is provided by annual attendance at science centers nationwide, which has grown from 32,500,000 on 1979 to 45,000,000 in 1986 in the most recent survey by the Association of Science-Technology Centers. Another indication of interest is the substantial viewing audiences for ISE-supported television programs, including 3-2-1 Contact, Square One, Reading Rainbow, and various science series for adults. Ratings surveys indicate daily audiences in the millions for these programs.

SENATOR MIKULSKI: What is NSF's 1991 budget for the Informal Science Education Program?

ANSWER: The FY 1990 Current Plan budget for ISE is $15.7 million. The FY 1991 request is $19.0 million.

SENATOR MIKULSKI: What would you do in this area if you had an additional $25 Million ?

ANSWER: As outlined in the NSF Strategic Plan document this level of support would allow new initiatives that would substantially broaden support for informal education activities throughout the country, including:

1. Television: NSF would become a primary funder of significant new television ventures; TV requires

annual expenditures of $3-$10 M per project, and we would then be able to support new initiatives in this area for educational television for children, as well as a major new initiative for adult programming in science and technology whose impact would be comparable to that of Nova or Nature.

2. Museums: A new program category would make awards for development of science centers and other museum facilities in population areas that do not now have effective informal learning resources, and for the improvement and expansion of existing institutions. Substantial planning and resource sharing would be a prerequisite for these awards.

3. Community Resources: Support would be provided for a broad range of community based science activities, to encourage science and math education by scouting organizations, girls and boys clubs, amateur scientific societies and other local organizations able to work with children. A portion would be awarded to national youth serving organizations and a portion awarded directly to meritorious local and regional projects in out of school learning.

4. Minority Resources: A new program would be developed that would support projects providing compensatory, extracurricular math and science education targeted at the specific improvement of school and college performance of minority youth.

5. Informal Science Education Systemic Resources Improvement: This new program would improve the infrastructure of informal science learning through three mechanisms--research and assessment; professional training and development; and resource sharing among institutions and informal education groups. These activities would serve to integrate museum, media, and informal community program modes, would build a stronger understanding of what works and what does not, would strengthen the professional abilities and skills of practitioners, and would insure that resources are shared widely and cost-efficiently. Informal education has not had access to these mechanisms in other, more academically oriented program of NSF or other agencies, and this effort will not duplicate other funding sources.

6. National Science and Technology Week. As this program has continued to grow in stature, preeminence and numbers of participants in recent years, such an increase would help focus much needed resources on this very effective program.

the Handicapped. Two new programs Alliances for Minority Participation and Faculty Recognition Awards for Women are initiated in FY 1991.

The following tables show the support requested for FY1991 as compared with the FY 1990 Current Plan.

SCIENCE AND EDUCATION PROGRAMS FOR WOMEN AND MINORITIES

SENATOR MIKULSKI: White males will constitute only about 32% of new entrants into labor force between 1988 and 2000. How much will the Foundation spend on programs designed to increase the presence of women and minorities in the science "pipeline" in 1991, what level of increase (in both dollars and percent) is this over 1990 and most importantly, when can we see some tangible results from these expenditures?

ANSWER: The FY 1991 budget requests a $31 million increase (49 percent) over FY 1990 for programs targeted on women and minorities. In FY 1991 the Foundation expects to provide $94 million for these programs. These efforts are of two types. First, our pipeline development initiatives prepare precollege students in science and mathematics, attract them to S&E majors, and retain them in S&E career tracks.

The major focus of the pipeline program increase is at the undergraduate level. We feel that there is a need for increasing our emphasis on improving the retention of minorities in S&E at the undergraduate level and increasing the number entering graduate school. A major reason for targeting the undergraduate level is the important role the NSF can play in stimulating the involvement of its grantee community and the importance of making a significant impact on the number of minorities attaining degrees in S&E within the next decade. Our goal is to stimulate a major increase in minority participation in S&E over the next decade. It should be noted that NSF's S&E budget was zeroed out in FY82 and that the programs mentioned here have been rebuilt since that year. Because it takes students 10 to 12 years to move from pre-college through PhD., results of these programs must be tracked over long periods.

Second, our R&D infrastructure initiatives focus on strengthening the research capability of selected minority institutions. We are requesting an additional $2 million under the R&D infrastructure programs to start 2-3 new Minority Research Centers of Excellence.

Programs focussed in this area are: Visiting Professorship for Women, Women in Engineering, Research Opportunities for Women, Research Improvement in Minority Institutions, Minority Graduate Fellowship, Research Careers for Minority Scholars, Minority Research Improvement, Minority Research Centers of Excellence, Career Access Awards, CISE Minority Institution Infrastructure, and Facilitation Awards for the Handicapped. Two new programs Alliances for Minority Participation and Faculty Recognition Awards for Women are initiated in FY 1991.

The following tables show the support requested for FY1991 as compared with the FY 1990 Current Plan.

WOMEN AND MINORITY SUPPORT

FY 1990	$63.1 million
FY 1991	$94.1 million - an increase of 49.1% over FY 1990.

THE TOTAL SUPPORT AND DISTRIBUTION BY MAJOR CATEGORY

	FY 90 CP	FY 91 Est.
Students	9.94	17.80
Faculty	8.85	15.07
Institutions	23.18	39.13
Other	21.13	22.08
TOTAL	63.10	94.08

SENATOR MIKULSKI: How do the two new proposed starts in this area, the Alliance for Minority Participation ($10 million) and the Faculty Awards for Women Program ($5 million), differ from current programs and when will we see specific "pipeline" results if we agree to fund them?

ANSWER: The Alliances for Minority Participation (AMP) and the Faculty Awards for Women Scientists and Engineers (FAW) complement and build on existing initiatives.

The AMP builds on the existing NSF ACCESS initiative, (which focuses primarily on precollege) by improving the undergraduate experience to stimulate substantial increases in the number of minorities that attain B.S. degrees and go on to graduate school in S&E. More importantly, the AMP while stressing the undergraduate level, requires proposers to develop linkages to precollege and to the graduate level, thereby providing a sustained continuum for minority students from the precollege through the PhD. AMP is also designed to serve as a mechanism for attracting other Federal and State agencies and the private sector to collaborate with us in this consolidated comprehensive approach. Since the program is designed to educate and train from high school through Ph.D., results will not be available for at least a decade.

The FAW program supplements our existing Research Opportunities For Women effort and the Visiting Professorships initiative. It focuses attention on the lack of women in senior academic ranks. Our existing programs focus more on the early career of women S&Es and on facilitating development leaves. Currently in the natural sciences and engineering there are approximately 54,000 full professors in U.S. colleges and universities; only 2500 or 5% are women. The FAW program expects to make a substantial increase in women at the full professor rank over the next decade.

EVALUATION OF NSF INNOVATIVE EDUCATIONAL MATERIALS

SENATOR MIKULSKI: For the past two years, the subcommittee has asked for reports evaluating the textbook publishers initiative. Why does it take so long to evaluate the effectiveness of this initiative, and why, in the absence of such conclusive results, do you want to expand this program into middle school math in FY 1991?

ANSWER: The publisher's initiative was just started four years ago, in 1987, and is scheduled for completion in FY 1991. Major curriculum projects designed for several grades may take three to five years for development and another two years for the materials to reach large numbers of students. The development includes writing student materials, writing teacher materials and other supplementary materials, pilot testing followed by materials revision, field testing for large numbers of students, preparation of final materials for publication, initial teacher training, and measuring student performance over an extended time period. Because school districts do not purchase text-books each year, sales do not reach their peak until the third year of dissemination. However, it is important to note that these programs are evaluated in a formative manner at every stage of a project. These evaluations indicate what changes and revisions need to be made in the instructional materials and what measures will strengthen the teacher preparation.

The middle school mathematics program is not part of the publishers initiative. However, the mathematics solicitation does include certain components of the publishers initiative. In this solicitation the involvement of a publisher or other disseminator is encouraged but not mandated.

SENATOR MIKULSKI: Shouldn't you be designing your education programs so we can determine their effectiveness far more quickly, particularly given the urgency of the problem and the large increases you're requesting in this area?

ANSWER: Guided by the management plan prepared for NSF pursuant to the mandate of this Committee ["OPPORTUNITIES FOR STRATEGIC INVESTMENT IN K-12 SCIENCE EDUCATION. Options for the National Science Foundation." SRI International; May 1987.] the Foundation requires that appropriate evaluation and assessment dimensions be built into every project, and effectiveness is the program outcome of greatest significance. In some cases, evaluative information is available while a project is still running; in other cases the information is available only at the end of the project; and in some cases credible evaluation may not be possible until years after. The Foundation "steers" its programs with the assessment data accumulated up to each decision point, the continuity of the process making possible increasingly well informed judgments. Education program evaluation is a complex field and the NSF is confident that its techniques, which continue to evolve, are themselves effective.

"The urgency of the problem" is a situation that has developed over a long period of time. For many years, the nation has deferred necessary improvement of its educational systems; it has neglected the continuing efforts required to improve curricula; it has failed to install the best technology and keep it up to date; it has not been willing to assure the continuing education and confidence of the educators themselves; and it has in other ways failed to meet the ever-changing requirements of a varied and vigorous population.

There are no "quick fixes" to this situation. The NSF's education programming is founded on the conviction that, as with fundamental research, the restoration and continuation of the health of science and mathematics education require long-term planning and continuing investment. Education projects are carried out on a wide spread of time scales and so must be the evaluation of their effectiveness -- some are completed in months and can be evaluated immediately; some take years to complete and evaluation done only after the passage of further years.

The Foundation has emplaced an assessment effort of growing size and sophistication. Early and tentative evaluation information is used to "steer" individual projects, and such information summed over many projects is used, similarly, to steer the NSF's individual programs. Some data of this kind lend themselves to projection -- permitting good guesses to be made about outcomes, and supporting mid-course corrections. In other cases, the only credible assessment data have the flavor of a final "grade" -- they tell one only how well the task was completed and support sequential program decisions. The Foundation is more concerned with program effectiveness than any other outcome, and is attempting to measure it as early and accurately as possible.

SCIENCE INFRASTRUCTURE -- FACILITIES & EQUIPMENT MODERNIZATION

SENATOR MIKULSKI: The Packard-Bromley Report (1986) on research in U.S. colleges and universities puts their "infrastructure" needs (facilities and equipment) at $10 billion over the next decade and recommends that $5 billion of the total should come from the federal government. If the federal government should be allocating $500 million a year for a decade to cope with this problem, how can you expect a $20 million program to be viewed as a credible facilities' initiative?

ANSWER: Although this is a modest amount relative to the cost of renovation projects and the need, it is considered a beginning. The Administration's request for this program for FY 91 is $20 million, in keeping with Congressional intent that the FY 1991 and FY 1992 budgets for the Academic Research Facilities Modernization Program be limited to $20 million per year. The limitation was due in large part to problems meeting the overall Gramm-Rudman deficit reduction targets. In fact, the Conference Report on the FY 1990 appropriation for NSF states that "The conferees agree that the $20,000,000 provided for this activity in fiscal year 1990 shall be maintained as the maximum program level during fiscal years 1991 and 1992."

An NSF program is only one mechanism for supporting research facilities. Other possible initiatives include: targeted programs in various agencies with appropriate funding; modification of the federal cost principles with regard to use allowances, depreciation, and other facility-related costs; and removal of or increase in the $150 million cap on tax-exempt bonds.

SENATOR MIKULSKI: The Packard-Bromley Report (1986) recommends that a facilities program be run exclusively through NSF. Doesn't a meager $20 million program invite every "mission" agency to either do their own program or encourage the kind of earmarking NSF has long sought to discourage?

ANSWER: Due to the limited funds, NSF has focused its program on renovation of research facilities in areas of science and engineering normally funded by NSF. It has been suggested that other agencies should initiate similar facilities renovation programs.

SENATOR MIKULSKI: What are the facilities' modernization needs by the following categories: community and junior colleges, predominately 4-year undergraduate institutions, and principally graduate research institutions (the top 100 research universities)?

ANSWER: According to Scientific and Engineering Research Facilities at Universities and Colleges: 1988 (NSF 88-320), the total estimated cost of required facilities renovation in 1988-89 was $3.6 billion. Of this total requirement, $777 million was spent for renovations in 1988-89. These funds came from various sources. Renovations at doctoral-granting institutions equaled $741 million, and renovations at non-doctoral-granting institutions equaled $36 million. Of the $777 million total, the "top 50" accounted for $445 million of the estimated renovations.

RESEARCH INSTRUMENTATION FOR UNDERGRADUATE SCHOOLS

SENATOR MIKULSKI: How much of this year's major equipment and instrumentation budget do you estimate will go to major research institutions and how much to schools that focus predominately on undergraduate degrees?

ANSWER: Approximately 10% of all instrumentation funds go to predominately undergraduate institutions. However, within the Instrumentation and Laboratory Improvement program, over 60% of funds go to predominately undergraduate institutions.

SENATOR MIKULSKI: If these smaller, teaching schools are the key to producing our future science teacher corps and their needs can be more easily met with modest program awards (e.g. Notre Dame can replace all lab equipment for $500,000), why not put a larger share of funds to this class of schools?

ANSWER: We do. The Science and Engineering Education Activity awards only 40 percent of its funds to the top 100 universities and colleges. The remainding 60 percent goes to small colleges such as the predominantly undergradaute institutions to which you are referring, as well as other institutions to support science, mathematics, and engineering pre-college and undergraduate education, in addition to the Graduate Fellowship Program.

For example, the College Science Instrumentation Program (CSIP) was instituted by Congress in FY 1985 to address just the point you raise. That program has grown from $5.0 million in FY 1985 to $15.8 million in FY 1990, and is open to predominantly undergraduate institutions, notably 2-year and 4-year colleges and universities. The program has been expanded in recent years to include research universities as well, under the umbrella program "Instrumentation and Laboratory Improvement (ILI)". In the FY 1991 Request, the ILI program will be $23.0 million comprised of $16.0 million for CSIP and $7.0 million for research universities.

SENATOR MIKULSKI: How much of your budget goes to smaller teaching schools that principally serve traditional under-represented groups in science like women and minorities?

ANSWER: Minority institutions received $14.9 million from NSF in FY 1989. Additionally, the Foundation has made a sustained effort to enhance support for faculty research and training at predominantly undergraduate institutions. Over the past 6 years (FY 1983 - 89) support for research by faculty in these institutions has increased from about $30 million to $68.8 million, 4.3% of the NSF obligations in FY 1989.

Women and minorities are also at the "Tier 1" institutions, and in greater numbers, so that activities at these institutions have the potential to reach far greater numbers of students.

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

SENATOR MIKULSKI: Explain proposing in the FY-1991 budget initiating the Laser Interferometer Gravitational Wave Observatory (LIGO) while we have severe problems in filling the science personnel "pipeline" and decaying infrastructure at universities. Should the Nation sprint ahead in this area and trail the rest of the industrial nations in science and math overall?

ANSWER: There are several reasons. First, for several years now, we have deferred needed investments in facilities; we cannot continue to do so. These facilities are not only crucial to maintain our science and engineering preeminence in the world, but will also attract bright, enthusiastic young people to the world of science.

Second, results from the research associated with this project will be of great interest to the lay public, generating an aura of excitement and discovery which will provide just the sort of stimulation which induces young people to consider embarking on careers in science and engineering.

Third, interferometric gravitation-wave detection is a unique, developing area of cutting-edge scientific investigation that will provide training for scientists across a wide range of levels--undergraduate, graduate, and postdoctoral.

And finally, the associated research fields including:

-high precision metrology (the science of measurement);
-highly efficient lasers;
-high power lasers, mirrors, optical components and coating;
-highly stabilized lasers (useful for research and communication);
-vibration isolation lasers (useful for semiconductor chip
making and processing, precision machine tools, electron microscopy), and;
-sensor development

stimulate technology development that has potential industrial, defense and space applications.

SENATOR MIKULSKI: How critical to scientific progress is the construction of the gravity wave telescope?

ANSWER: LIGO will be used for research into the nature of gravity, and it will open up an entirely new window onto the universe. It will thus be a scientific tool both for physics and for astronomy. The discovery of gravity waves will be one of the most important scientific steps of the century. In fact, it is likely that whoever is able to demonstrate the existence of gravity waves will be awarded a Nobel Prize.

In addition to the basic, fundamental understandings of the universe that will be exposed (direct verification of gravitational waves, verification of the existence of black holes, observation of the birth of a neutron star, starquakes, and many others of which we have no inkling right now), technology development with potential industrial, defense, and space applications will be stimulated. These latter include development of highly efficient lasers, highly stabilized lasers for research and communications, vibration isolation systems useful for precision machine tools and semiconductor chip making, high precision metrology, and advances in mirrors and optical components and coatings.

SENATOR MIKULSKI: How does LIGO differ in scientific information gained and in cost as compared to NASA's planned Gravity Probe-B experiment? Are there alternative approaches that are less costly and perhaps more sensitive (e.g., gravity bar antennae)?

ANSWER: For more than 20 years, the U.S. government has supported the development of a high precision gyroscope at Stanford University, in order to check one of the predictions of Einstein's General Theory of Relativity. This evolved into the present NASA project known as Gravity Probe B (GPB) which is approaching flight status.

The goal of this project is to verify the phenomenon variously known as the "Lense-Thirring effect", or the "dragging of the inertial frame" due to the Earth's rotation. This can be thought of as a manifestation of new gravitational forces predicted by Einstein, which are created by uniformly rotating masses. There is a very close analogy between these gravitational forces and the magnetic forces produced by uniform electric currents, and so these new forces are often called "magnetic-gravitation". Although extremely small, they may be detected by their effects on another spinning object such as the unique gyroscope which Stanford hopes to place in orbit. The cost for deployment of the GPB is about $246 million.

While LIGO also seeks to detect new gravitational forces predicted by Einstein, these are complementary to, and substantially different from, those sought by GPB. LIGO seeks to detect gravitational radiation, closely analogous to electromagnetic radiation (light, radio, x-rays, etc.). This would be a new manifestation of the effects predicted by Einstein's theory, and is of outstanding importance both as fundamental physics and as a new window for astronomical exploration.

Detection of gravity waves and exploration of their strongest astronomical sources might be approached by other methods. For example, Earth-based bar detectors have been under development since the early 1960s, a decade longer than interferometric detectors. A crucial difference between bar and laser detectors is that bars are essentially narrow-band receivers, while lasers allow broad-band operation. This is analogous to building a new radio receiver (bar) which can tune to only one station, and another (laser) which can scan many available channels simultaneously, allowing for the reception of much more information.

A second important bar-laser difference lies in the ultimate sensitivity which these instruments can reach before confronting fundamental barriers. It turns out that lasers have several orders of magnitude additional capability--100 to 1000 better performance (depending on frequency) for laser interferometers over bar antennas.

GLOBAL CLIMATE CHANGE RESEARCH

SENATOR MIKULSKI: What is your current assessment of the Global Climate Change problem? Is the globe warming or not? Is regional climate being affected?

ANSWER: The best recent estimates of global warming indicate that the earth's atmosphere has warmed less than 1°C during the last century. This value is less than expected based on the increase in CO_2 that occurred during this interval, and the increase has not been monotonic. The earth's atmosphere increased in temperature from about 1860 until about 1940, but from 1940 to about 1970 the earth's average temperature decreased. The 1980s have been warmer than any other decade in the last century. On the basis of paleoclimate indicators in tropical ice cores, the last 50 years have been warmer than any time during the last 10,000 years. But because the earth's climate varies naturally on decadal to century time scales, we cannot yet isolate the natural response of climate change from the anthropogenic effect.

Global Climate Models (GCMs) predict a 2 to 5°C increase in the mean temperature of the earth by the middle of next century, when atmospheric CO_2 concentrations are expected to be about twice the pre-industrial value of 280 ppm. The models predict a monotonic increase in temperature, in contrast with the observed average temperatures of the earth for the last century. If the observed record of earth temperature is accurate, then the models are not yet accurately representing some major climate process or processes. There are natural climate processes, in particular cloud-radiation feedbacks, ocean-atmosphere feedbacks, and the water cycle, that are treated only in a rudimentary fashion by the existing, state-of-the-art GCMs. These processes can have a major effect on global and regional climate, and it is not yet known whether these feedbacks will enhance or mitigate future climate change.

The effects of global warming on regional climate are even less clear. The observational data are ambiguous. There are four state-of-the-art GCMs and each produces a different prediction of regional climate effects for a doubled atmospheric CO_2 concentration. The differences are particularly evident for the hydrological cycle. Regional predictions for future rainfall and evaporation differ to the extent that some GCMs predict moister mid-continents while others predict drier. At this time, it is not possible to say with confidence that global warming is affecting regional climate.

SENATOR MIKULSKI: What are the points of the Global Climate system that we now recognize as likely to be sensitive, and if perturbed, may lead to societal-induced changes in climate?

ANSWER: The Global Climate system is complex, and links atmospheric, oceanic, land surface, and ecosystem processes with solar radiation that drives the system. These in turn, govern atmospheric and oceanic circulations and associated distributions of temperature, moisture, clouds, and precipitation over the surface of the Earth. Climate changes are changes in the patterns of temperature, precipitation, and severe weather. Components of the Global Climate system which may be perturbed by human influences, and which may lead to changes in climate are: the role of clouds, including cloud-radiation feedbacks; the chemical and physical processes that control the atmospheric distributions and lifetimes of trace chemical species; ecosystems responses and feedbacks on climate and atmospheric composition; the exchange of chemicals, water and energy between the ocean and the atmosphere; and land surface hydrology.

SENATOR MIKULSKI: How long must we wait for the science community to give us recommendations on reasonable mitigation actions that correct the problem?

ANSWER: The uncertainties in our ability to predict societal-induced changes in climate are really a problem with our modeling capabilities. The models generally predict, for example, that continued release of greenhouse gases will cause a warming of the planet. The scientific community generally accepts that there will be some warming. It ranges from virtually no warming over the next fifty years to about 5°C, with most scientists estimating a warming of one to two degrees. The issue is how fast and how much.

Model uncertainties are due to inadequate computing capability and insufficient understanding of coupled biological, geological, chemical, and social processes. Even with the development of new state of the art models, they will have to be tested using real data that will need to be collected and interpreted. Until these advances are achieved, the scientific community will be unable to provide recommendations for mitigation that are based upon proper knowledge. However, in the meantime, certain actions have been, or can be taken which would help. The Montreal Protocol addressed the ozone hole problem by international agreements to reduce chlorofluorocarbons in the future. The White House Conference on Science and Economic Research Related to Global Change (April 17-18, 1990) brought together Ministerial-level representatives from twenty countries to examine scientific and economic issues relevant to policy on global change in an effort to identify the data and methods required for the development of international policy on climate change. Energy conservation measures would slow the rate of release of greenhouse gases and help in the eventual stabilization of carbon dioxide in the atmosphere.

SENATOR MIKULSKI: What are the major gaps in scientific understanding that prevents the scientific community and you from giving us more definitive answers? How do you rank them in importance?

ANSWER: In the development of its FY 1990 research plan (Our Changing Planet: The FY 1990 Research Plan), the Committee on Earth Sciences (CES), in consultation with the National Academy of Sciences' Committee on

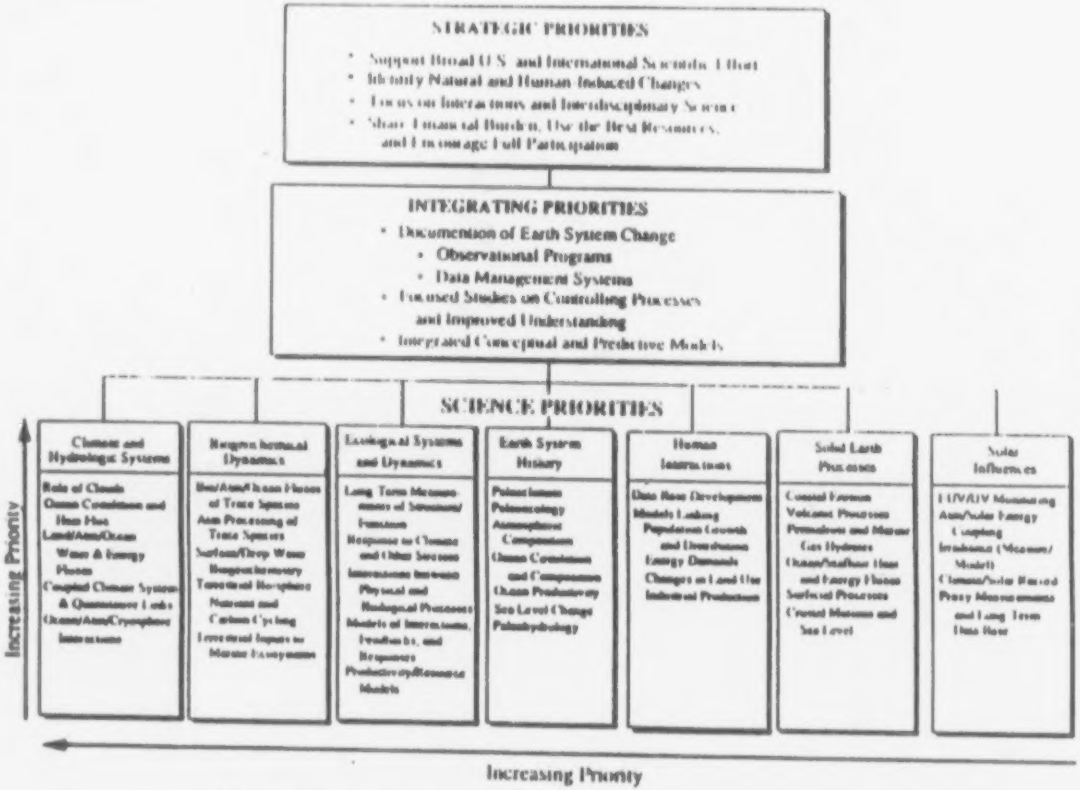
Global Change, conducted an analysis of the strengths and weaknesses of the existing U.S. Global Change Research Program (USGCRP). They used the results of this analysis, together with several science community documents, to identify a set of science gaps in scientific understanding that limit the ability of the scientific community to give more definitive answers to questions about global change.

We have included below the Priority Framework table, developed by CES. For each of the seven interdisciplinary science elements of the USGCRP--Climate and Hydrologic Systems, Biogeochemical Dynamics, Ecological Systems and Dynamics, Earth System History, Human Interactions, Solid Earth Processes, and Solar Influences--research areas where there are gaps in scientific understanding are listed in descending priority order. The seven interdisciplinary science elements are also given a priority ranking, with Climate and Hydrologic Systems as the highest priority and Solar Influences as the lowest. The importance of neighboring items in the table is similar.

SENATOR MIKULSKI: How do NSF studies and campaigns address these major gaps in knowledge? What increased capability will we get out of these investigations that will aid us in making policy decisions? What is your budget for Global Climate Change; how does NSF see the priority of this program? What would you do with +$200 million, and how would it improve your ability to provide policy relevant results and predictions?

ANSWER: Research on global environmental change supported by NSF addresses gaps in understanding in all seven of the interdisciplinary science elements of the CES (see attachment). The National Science Foundation, through its Geosciences Activity and Biological, Behavioral, and Social Sciences Activity, supports global change activities through 15 ongoing programs, with 6 additional programs proposed for FY 1991.

Examples of NSF-funded research that address major gaps in scientific knowledge include: (i) Tropical Ocean/Global Atmosphere (TOGA) Program. Measurements of sea surface temperature and ocean currents resulting from this ongoing interagency program are providing real-time updates for coupled ocean-atmosphere models predicting seasonal and inter-annual climate variability; (ii) Greenland Ice Sheet Project II (GISP 2), part of NSF's Arctic Systems Science (ARCSS) initiative. Highly successful field work in FY 1989 led to the acquisition of 800 meters of ice core to be used in studies of the earth's climate history; (iii)


STRATEGIC PRIORITIES
• Support Broad U.S. and International Scientific Effort
• Identify Natural and Human-Induced Changes
• Focus on Interactions and Interdisciplinary Science
• Share Financial Burden, Use the Best Resources, and Encourage Full Participation
INTEGRATING PRIORITIES
• Documentation of Earth System Change
• Observational Programs
• Data Management Systems
• Focused Studies on Controlling Processes and Improved Understanding
• Integrated Conceptual and Predictive Models
SCIENCE PRIORITIES
Climate and Hydrologic Systems
Role of Clouds
Ocean Circulation and Heat Flux
Land/Atm/Ocean Water & Energy Fluxes
Coupled Climate System & Quantitative Links
Ocean/Atm/Cryosphere Interactions
Biogeochemical Dynamics
Bio/Atm/Ocean Fluxes of Trace Species
Atm Processing of Trace Species
Surface/Deep Water Biogeochemistry
Terrestrial Biosphere Nutrient and Carbon Cycling
Terrestrial Inputs to Marine Ecosystems
Ecological Systems and Dynamics
Long Term Measurements of Structure/Function
Response to Climate and Other Stresses
Interactions between Physical and Biological Processes
Models of Interactions, Feedbacks, and Responses
Productivity/Resource Models
Earth System History
Paleoclimate
Paleoecology
Atmospheric Composition
Ocean Circulation and Composition
Ocean Productivity
Sea Level Change
Paleohydrology
Human Interactions
Data Base Development
Models Linking Population Growth and Distribution
Energy Demands
Changes in Land Use
Industrial Production
Solid Earth Processes
Coastal Erosion
Volcanic Processes
Permafrost and Marine Gas Hydrates
Ocean/Seafloor Heat and Energy Fluxes
Surficial Processes
Crustal Motions and Sea Level
Solar Influences
EUV/UV Monitoring
Atm/Solar Energy Coupling
Irradiance (Measure/Model)
Climate/Solar Record
Proxy Measurements and Long Term Data Base
Increasing Priority
Increasing Priority

U.S. Global Change Research Program Priority Framework

Joint Global Ocean Flux Study (JGOFS). JGOFS, an ongoing interagency program, successfully completed a five nation study of the 1989 spring phytoplankton bloom in the North Atlantic--a critical event in the biological transfer of carbon to the deep ocean; (iv) Geologic Record of Global Change. This program supports research on the geological and paleontological record of the Earth. Such studies provide the data against which models constructed to predict global change may be tested, and the only way by which the anomalies introduced by man may be evaluated against natural variations.

By reducing the uncertainty of our current scientific understanding, all of the NSF global change programs will contribute to an increased capability to make policy decisions, although the time required for uncertainty reduction will vary depending on the research area.

The NSF budget for the U.S. Global Change Research Program is $55M in FY 1990 and $103 million in the President's FY 1991 Budget Request. Global change research is among NSF's highest priorities.

Understanding the complex interactive systems that make up our environment is not an easy task. While scientific understanding of these systems is increasing, the goal of developing integrated, predictive models of the earth system cannot be met in the near term, even if resources were doubled. Although NSF and the other CES agencies could profitably make use of additional funds for global change research, the ability to provide policy relevant results and predictions will take time; a resource doubling will not bring the answers twice as fast.

SENATOR MIKULSKI: What does NSF see to be the major science gaps in the Global Climate program that are not being addressed by NSF or by a mission agency?

ANSWER: We feel that gaps in scientific understanding of the global earth system, identified through the CES analysis, are being addressed by the CES research agencies. However, some of the activities required to increase understanding are not yet completely developed and coordinated. For example, the highest priority research area identified by CES--the Role of Clouds--is being addressed by some agency programs, but a broader attack on the problem is still needed. Work is in progress under Human Interactions addressing Data Base Development and Models; however, these efforts are still in their infancy and much more research is needed. In Ecological Systems and Dynamics, additional research programs need to be developed to further our understanding and ability to model ecosystem response and interactions with the physical climate system. Developing predictive models of the earth system is a main goal of the USGCRP. Increased efforts to improve modeling capability and develop integrated, predictive models of the global climate system that cut across all seven science elements are required.

SENATOR MIKULSKI: What interdisciplinary research areas are assigned to NSF, and how does NSF use its existing management structure to manage them?

ANSWER: NSF is responsible for maintaining the health of basic research in all areas of Earth, atmospheric, and ocean sciences, including the relevant biological and social sciences and research in the polar regions. The interdisciplinary research program is focused on ground-based studies on regional and global scales; large-scale field programs; interpretation and use of remotely sensed data and geographic information systems; theoretical and laboratory research; facilities support; and the development of the numerical models, information and communication.

SENATOR MIKULSKI: What is NSF's participation in areas such as clouds, tropospheric and stratospheric chemistry, and bio-feedback processes? Are our best university researchers involved in the Global Climate Change program in these areas?

ANSWER: The National Science Foundation supports a broad base of activities in Global Change research. In the area of clouds, the primary research will be in the Global Energy and Water Cycle Experiment (GEWEX). An important objective of GEWEX is the development of regional climate models that include the role of clouds. GEWEX will build on the work already accomplished in the International Satellite Cloud Climatology Project (ISCCP) of the World Meteorological Organization's World Climate Research Program.

NSF support of atmospheric chemistry covers both the troposphere and the stratosphere and includes laboratory, theoretical, and field investigations of chemically and radiatively active trace gases. Indeed, the Global Tropospheric Chemistry Program (GTCP) represents the National Science Foundation's participation in the U. S. Global Change Research

Program in these areas. Examples of tropospheric activities include large field experiments such as the Atmosphere/Ocean Chemistry Experiment, an NSF-supported program designed to address major scientific issues related to atmospheric and marine chemistry centered on the North Atlantic Ocean; and the recently completed US - USSR Pacific expedition to study the atmospheric chemistry and sources of trace gases and aerosols. Laboratory and theoretical investigations include the study of the chemistry and transport of greenhouse gases and other species both regionally and globally. Stratospheric chemistry research includes laboratory investigations of heterogeneous processes involving chlorine and ice particles in the depletion of ozone, field campaigns to both the Antarctic and Arctic to study the seasonal ozone hole phenomenon, and theoretical studies of the photochemistry and transport of species, including determination of the level of, and the processes responsible for, global ozone loss.

NSF is also supporting research efforts aimed at understanding the relationships between the biosphere and the physical climate system. One area of current emphasis concerns the role terrestrial and marine ecosystems play in controlling or altering the chemical composition of the atmosphere and how this may impact such elements of the physical climate system as regional precipitation and cloud formation processes.

Many of the Nation's best university researchers have been involved in the planning of the research activities of the Global Change Program. As the Program continues to mature, more will join the effort.

SENATOR MIKULSKI: What is the scientific community's capability to provide scientists and engineers for Global Climate Change research? Is this program depleting the pool needed for maintaining our technological society? Where the mission agencies draw down the basic scientist pool in various areas (e.g., cloud research), who has the responsibility to replenish it? Are you replacing the people you are taking out of such basic research pools?

ANSWER: The U.S. scientific community can provide enough trained scientists and engineers for research needs of global change by retraining scientists from other areas without impacting our scientific and technological base. Many scientists merely move from one set of research problems to another. In areas where more trained people are required, such as modelling and the application of supercomputers and large data bases, post-doctoral programs are underway to train or retrain individuals.

An NSF program that will specifically address this issue is the U.S. Global Change Education and Training Program developed in response to recommendations by the Committee on Earth Sciences. Requested funding for this program in FY 91 is $9.1 million. NSF is also seeking to broaden the Nation's development of education and human resources in sciences and engineering by increasing the participation of women, minorities and handicapped individuals. It is programs such as these - high visibility and national interest - that help to attract students to science and engineering careers.

SUPERCOMPUTERS AND HIGH PERFORMANCE COMPUTERS

SENATOR MIKULSKI: In September 1989, OSTP issued a report on the Federal High Performance Computing Program, which contained these goals: 1) maintain and extend U.S. leadership in high performance computer (HPC) technology and encourage U.S. sources of production; 2) encourage innovation in HPC technology by increasing their diffusion into U.S. science and engineering communities; and 3) support U.S. economic competitiveness and production through greater utilization of networked HPC in analysis, design, and manufacturing. Has the Administration given NSF a leadership role in achieving these goals?

ANSWER: The HPC plan as proposed by OSTP is a balanced program with various agencies leading in areas of historical strength, with interlocking responsibilities for different portions of the plan. NSF has a strong role in research on high performance systems and software, the provision of advanced high performance computing to all fields of research through dedicated facilities such as the National Supercomputer Centers, and lead roles in the Networking and the Education and Human Resources parts of the plan.

SENATOR MIKULSKI: Since the FY 1990 budget request for Computer and Information Science and Engineering (CISE) was reduced -11.1%, why is the FY 1991 request for CISE increased only +13.8% in actual dollars? How much ground have we lost in international leadership in this area?

ANSWER: Part of the disparity observed is due to the termination of support for one of the NSF Supercomputer Centers. The termination of the John von Neumann Advanced Scientific Computing Center makes available about $7-8 million in the "base" budget, which now supports four rather than five supercomputer centers. The funding levels are adequate and do not effect our international leadership.

SENATOR MIKULSKI: What is NSF doing to make the case for establishing scientific and commercial leadership in supercomputer development technology and applications?

ANSWER: The NSF Centers have been leaders in extending supercomputer applications through their industrial affiliates program. For example, the Eli Lilly Company was convinced to become an industrial affiliate of the National Center for Supercomputing Applications at the University of Illinois. This major company had never used a supercomputer previously. After three years, they found the use of a supercomputer so enhanced their efforts that they purchased their own Cray computer. The Centers have played a major role in convincing companies, large and small, that the supercomputer can lead to increased productivity and decreased lead time in producing new products.

The Centers have also been innovators in creating new software and program development tools which are then freely distributed to the entire community.

SENATOR MIKULSKI: What is the penetration of Advanced Alternative Computers (AAC) into the scientific community? What is the role of NSF in introducing this technology and encouraging its use by the civilian U.S. sector, including universities and industrial companies?

ANSWER: The penetration is small at present because of the relatively undeveloped state of these technologies. To provide more experience to a wide range of researchers, DARPA has recently placed Connection Machines at the NSF Supercomputing Centers at Illinois and at Pittsburgh. NSF is providing the software and consulting support to make these machines available to the scientific community. Portions of the increase requested in the FY 1991 Budget allow for upgrading the hardware and funding the software development effort.

SENATOR MIKULSKI: Mathematical modeling to assess complex social and technological problems will require supercomputers and AACs that are not yet developed. Is NSF the appropriate agency for encouraging development of AACs for these applications? How should the computer power required be determined and development scheduled?

ANSWER: DARPA has a major initiative in the development of the machines themselves and it would be inappropriate for NSF to duplicate this effort. NSF is working in close cooperation with DARPA to make these new machines available to the research community, and NSF has focused many of its software research programs towards improving the operation and application of new parallel processing computers.

SENATOR MIKULSKI: What magnitude of supercomputer/AAC budget is needed to support individual investigators and large groups? What should be the balance? What is our status in achieving the goal and maintaining it?

ANSWER: One of the difficulties with the new architecture machines is the relative immaturity of the software and the small number of people who know how to program them effectively. As a result, the demand for AAC use/time is not there, and the magnitude of budget required is not estimable.

A research and educational training program is needed to provide researchers the opportunity to explore the usefulness of such machines, develop software packages, and train post-docs and graduate students in their use. If such an architecture as the ACC provides better, less costly service, then the scientific community will naturally embrace it.

Two strategies might help to promote the most progress both for scientific applications and for the improvement of the computing technology. One strategy might be to create centers equivalent to the NSF Supercomputer facilities, concentrating software development and service expertise as well as education and training. Like the present NSF Supercomputer Centers, this would provide support to hundreds of individual investigators. The fastest of the new machines will be very much like conventional supercomputers in cost and service requirement and would require such Centers, and thus be similar to the present NSF Centers.

The other strategy could provide (because these new machines will be "modular") smaller, less capable versions to small research groups for concentrated applications, in the way that scientific computing instruments are throughout the NSF.

EARTHQUAKE RESEARCH AND ENGINEERING -- NATIONAL NEEDS

SENATOR MIKULSKI: Considering the likely event of a pending earthquake of at least magnitude 5 in the eastern U.S. by the year 2010, how should NSF's funds be divided between science and engineering to best serve the public's interest?

ANSWER: The eastern U.S. is a very large area in which little or no consideration has been given to earthquake-resistant construction in the past. The legacy is an inventory of buildings that would not perform well near even a moderate-sized earthquake such as a magnitude 5. Moreover, the cost for upgrading or replacing the hazardous structures is staggering, hundreds of billions of dollars, for the areas where earthquakes have occurred in the eastern U.S. in historical times. We know little about the causes and timing of these events and therefore must assume that our historical record, which is brief in geological time, does not include all of the seismically active areas.

Thus, science and engineering research must be used to address the problem in two ways. First, engineering research must be pursued to investigate the most effective and cost-efficient ways to strengthen existing structures and life-lines and design building codes that will minimize the burden on the ultimate source of these billions of dollars of construction funds, local structure and building users.

Second, fundamental earthquake studies are necessary to provide an assessment of earthquake hazard such as the size, location, and recurrence frequency of earthquakes and information on the local geological formation's response to seismic waves. This information can tell us where to concentrate our limited resources for building strengthening. Intermediate-term forecasts of increased earthquake probability have already proven invaluable in triggering earthquake preparedness exercises that substantially enhanced emergency response to the Loma Prieta earthquake.

A balanced National Earthquake Hazard Reduction Program (NEHRP) needs to have a broad-based, innovative, program of engineering research and fundamental earthquake research in order to provide the new knowledge that is needed to guide both local and National earthquake preparedness activities.

SENATOR MIKULSKI: Is it likely that earthquake prediction capability will improve as to give the public 3 to 12 hours of warning before an event? What is the most likely advance warning time we will get?

ANSWER: There have been clear successes in public warning of a major earthquake a few hours prior to the event, such as in China where thousands or possibly hundreds of thousands of lives were saved. However, it is equally clear that the same precursors do not occur before all earthquakes. Precursory signals most likely depend on the fault type and regional geologic setting, and different regions may exhibit different precursors to an event. The best answer now is that the science has not advanced to the stage where we can say whether we can give 3 to 12 hours of warning, or what the most likely warning time will be.

However, many scientists have been recently encouraged by the emergence of new seismic and positioning technology and the application of new statistical techniques to earthquake occurrence. As in all research, new discoveries are difficult to anticipate. But, it is clear that the past few years have seen accelerated progress in earthquake hazard estimation via understanding of the physics of crustal distortion and rupture.

SENATOR MIKULSKI: Is earthquake engineering in a position such that immediate increases of funding would substantially reduce risk to loss of life and property? What degree in risk reduction would +$15 million/year in engineering yield within the next ten years?

ANSWER: Recent California earthquakes such as the Loma Prieta (1989) and Whittier (1987) earthquakes have demonstrated that systems designed and constructed in accordance with current earthquake resistant procedures developed from our past research results have not collapsed, while systems designed without earthquake considerations or constructed without compliance with special earthquake resistance details have resulted in major loss in life and property. These earthquakes have also demonstrated that existing techniques for upgrading the seismic resistance (strengthening) of existing buildings and lifelines do not accomplish all that the analyses predict. Therefore, public officials are reluctant to impose costly upgrading requirements when the perception of the seismic risk is low, assessment of the seismic capability of buildings or lifelines is judgmental, and the effectiveness of the upgrading techniques is uncertain.

At the present time seismic upgrading of existing buildings and lifelines (bridges, pipelines, water distribution systems, electrical and communication systems, etc.) provides the greatest opportunity to reduce earthquake risk to human life and property over the next ten years. Vulnerable construction which has not been designed to modern earthquake resistant standards is located throughout the USA.

It is physically and economically impossible to upgrade all vulnerable systems throughout the US before the next earthquake occurs. Our resources must be used in the most efficient manner possible to achieve the greatest benefit for our citizens. This task involves three steps: (1) identifying the vulnerable facilities, (2) establishing structurally effective and cost-efficient techniques for seismic upgrades of these facilities, and (3) implementing a program of priority upgrading. These steps are described in the following:

(1) Identifying the most vulnerable facilities: NSF Engineering sponsored a workshop in November, 1989 to define research needed to assess the vulnerability of existing buildings in the eastern US. The workshop participants recommended a four part research and development program which includes (a) building inventories, (b) structural behavior research, (c) new and improved methods for nondestructive testing, and (d) codes, design resources and training courses.

(2) Establishing structurally effective and cost efficient techniques for upgrading: NSF Engineering recently announced a research program on techniques for **Repair and Rehabilitation Research for Seismic Resistance of Structures**. At least $500,000 per year has been designated for this effort. It should be noted that after the Loma Prieta earthquake CALTRANS spent about $4 million to test one section of Interstate 880 (Cypress Freeway) two-level viaduct in Oakland, California to evaluate various techniques for upgrading other two-level viaducts throughout California for their effectiveness and economy. Full size experimental verifications are necessary to establish effectiveness and cost data with the reliability desired by public officials. By involving the professional design community and public officials in research efforts and full-size tests, the results will be immediately utilized in upgrading existing facilities.

(3) Implementing a program for upgrading: NSF Engineering research can help to establish criteria leading to policies which identify priorities for upgrading in any community. It is the responsibility

of the Federal, state and local governments to provide motivation for private construction upgrading and finances for public construction upgrading. Appropriate action, such as Executive Order 12699 for "Federal and Federally Assisted New Buildings", is needed for existing buildings and lifelines. The urgency for action is recognized by the technical community and by some public officials.

The degree in risk reduction that +$15 million/year for NSF Engineering Earthquake Hazard Mitigation Program could yield in the next ten years can be summarized as follows:

* tools and training for seismic evaluation of existing buildings and lifelines could be provided to practicing professionals and public officials,

* structurally effective and cost efficient upgrading techniques for existing buildings and lifelines could be created,

* criteria for upgrading priority decisions could be established for use by public officials,

* several high priority demonstration projects, such as schools, could be upgraded using these tools, techniques, and criteria.

To achieve risk reduction, these steps must be combined with legislation requiring public officials to implement seismic upgrading for seismically vulnerable construction within their jurisdiction. The rate of risk reduction depends not only upon the development of these necessary capabilities, but to a higher degree on the financial commitment of the owners (private and public) to seismic upgrading.

INDIVIDUAL INVESTIGATOR PROPOSED RESEARCH

SENATOR MIKULSKI: Do you have a mechanism to recognize high risk with high payoff proposals? Is NSF able to get truly innovative proposals through its peer review system? How can the rate be increased?

ANSWER: NSF encourages all of its program officers to fund "cutting edge" work in the leading areas of research -- including "high risk" efforts -- and relies heavily on their expertise, experience and judgement to recognize and select the most promising proposals. The comments and ratings by peer reviewers are very important but in the NSF system they are advisory, not controlling.

NSF has recently implemented a program to encourage the funding of "high risk" proposals. Under the provisions of the Small Grants for Exploratory Reserach (SGER) program, a program officer may commit up to 5 percent of a program's budget to "high risk" proposals, with a limit of $50,000 per proposal. Program officers are not required to seek external review for these proposals.

SENATOR MIKULSKI: Does NSF management permit program directors to take risks on innovative ideas? What happens to NSF manager's reputation if a risky project fails?

ANSWER: In many cases decisions about particular proposals are extremely difficult, since work that is considered "risky" by some may be considered a foolish waste of scarce funds by others. A program officer's reputation does not rest on whether a "risky" project succeeds or fails, but on the overall quality of his or her entire "portfolio" of awards, as viewed by colleagues, supervisors and the research community (in the form, for example, of periodic Committees of Visitors).

Many researchers and program officers believe that reviewers tend to become too "picky" and conservative when funds are extremely constrained. Partly to address that perception and partly to provide a vehicle for quicker decisions when necessary, the Foundation has begun offering an alternative proposal mechanism known as "Small Grants for Exploratory Research" (SGER). Applicants may request up to $50,000 for one year for exploratory, high-risk research, specifically including preliminary work on untested and novel ideas; ventures into emerging research areas; research having a severe urgency with regard to availability of data or equipment; or efforts of similar character likely to catalyze rapid and innovative advances. Only one copy of a very brief proposal is submitted. Decisions are made directly by program officers without formal external review. Program officers may commit up to five per cent of their budgets for SGERs. Based on the first seven months of operation, this effort appears to be off to a good start; an initial assessment is underway and periodic assessments are planned.

INDEPENDENT PROJECT AUDITS

SENATOR MIKULSKI: While NSF increases the I.G.'s budget by 15% ($440,000), the ratio of the number of awards to the I.G. FTEs actually gets worse. For 1990, the ratio is 695 awards per FTE; for 1991, the ratio is 700 awards per FTE. What percentage of NSF's grant audits will be done in-house and what percentage will be contracted out?

ANSWER: NSF's audit coverage of its funded organizations continues to be a matter of primary concern to the Office of Inspector General. OIG's predecessor organization conducted few external audits and relied almost exclusively on the services of contract auditors for cost and compliance assessments of its grantees. As part of her first year initiative, the Inspector General began to increase OIG's in-house external audit capability. The external audit function was strengthened by the formation of four external audit teams which performed six audits in the second quarter of FY 90. Although it is too early to draw firm conclusions about the cost-effectiveness of the new external audit approach, the early indicators confirm our belief that, in many instances, cost and compliance audit work can be accomplished more quickly and at less cost by using OIG employees rather than contracting with private sector audit firms.

Because the results of the external audit initiative are so preliminary, we have not yet made a decision about the percentage of grant audits to be conducted by OIG auditors on a yearly basis. This committee requested a full report on this issue by the end of this calendar year. We hope to have a more definitive answer at that time.

SENATOR MIKULSKI: Why does the grant award number to I.G. FTEs ratio increase next year, and what is your plan to reduce NSF's dependence on outside auditors?

ANSWER: The ratio of grant awards to OIG FTEs deterio-rates in the next fiscal year because the Foundation's program funding is growing faster than OIG's ability to hire and train staff to provide audit coverage. Development of a first-rate, in-house, external audit capability at the Foundation will take time. In the interim, contract auditors (whose work is carefully reviewed by OIG staff) will provide audit coverage.

PAY RAISE

SENATOR MIKULSKI: Does the FY 1991 budget request from NSF contain funds for the pay raise for the general workforce and for the Senior Executive Service? If not, why not?

ANSWER: The FY 1991 request for personnel compensation and benefits contained in the Program Development and Management (PD&M) activity contains an increase of $4.4 million over the FY 1990 estimate. This increase provides for the estimated cost of the Senior Executive Service pay raise effective in FY 1991, the full year cost of FY 1990 general workforce pay raise, and the personnel compensation and benefits associated with a modest staff increase.

Sufficient funding is requested within the Research and Related Activities (R&RA) appropriation as a whole to provide for the FY 1991 general workforce pay raise, currently estimated at $1.9 million, through reprogramming from other activities. This approach is consistent with the Foundation's usual budget presentation.

Since actual amounts transferred in prior years have been well below the cost of the pay raise, this approach maximizes resources available for research activities. However, because recent R&RA appropriations have contained limitations on the PD&M activity, each transfer needed to cover a pay raise has required enactment of a supplemental appropriation. The language proposed for the FY 1991 R&RA appropriation excludes a specific limitation on the PD&M activity. This will make it possible to transfer, with Committee approval rather than legislative action, the amount of pay raise cost that cannot be absorbed within the PD&M activity.

MINORITIES AND WOMEN IN WORKPLACE

SENATOR MIKULSKI: What is the composition of minorities and women in the NSF workforce? What is the composition at GS-14 and higher? What is your plan to increase the numbers at the higher levels?

ANSWER: As of April 8, 1990, the total NSF workforce is 1,273 employees, of which:

- Women comprise 57% of the workforce
- Minorities comprise 39.5% of the workforce
- Minorities and women combined comprise 65% of the workforce

As of April 8, 1990, there are 561 NSF employees at the GS-14 (or equivalent) levels and higher of which:

- Women comprise 24%
- Minorities comprise 11.4%
- Minorities and women combined comprise 33%

In administrative positions at the Foundation, there is no underrepresentation of any sex-specific racial/ethnic group. Having reached an appropriate profile in that category of jobs, NSF has stopped affirmative employment efforts, in accordance with numerous court decisions.

Most scientific and engineering positions at the Foundation that are outside of the Senior Executive Service (SES) are at Grades 14 and 15 (and their equivalent excepted service pay levels). Comparing the profile of that work force with the pool from which the Foundation hires its scientists and engineers (roughly, Ph.D.'s in the various scientific and engineering disciplines), the Foundation has fewer Asians and Hispanics than it might be expected to have. Studies made of recruitment of scientific and engineering staff have consistently shown that the only fruitful method for locating "cutting edge" staff is recruitment through the personal contacts of the scientists and engineers at NSF. To ensure that the Asian and Hispanic networks are tapped, the Foundation has established means for notifying all Asian and Hispanic scientific and engineering staff of vacancies as much as 18 months in advance of these vacancies so that they may tap their networks.

The Senior Executive Service is recruited largely from both internal Foundation staff at the Grades 15 (and equivalent) and from outside sources. Each directorate of the Foundation is expected to show a net increase in the representation of women and minorities in its SES work force by the end of FY 1992. If those goals are met, the Foundation's SES component is likely to have an appropriate EEO profile.

ANTARCTIC PROGRAM

SENATOR MIKULSKI: NSF has requested $175 million for Antarctic Program in FY 1991. This is an increase of $23 million, or 15% over FY 1990. Of the increase, $21 million (92%) will go to "Operations" and the cleanup initiative. Are we reaching a point in NSF's operations and construction needs at the Antarctic where basic research is being squeezed due to increasing logistical costs there?

ANSWER: No, the research program is not being squeezed out. If not for the research program, there would be no operations programs, which serves to support the research. Funding for the U.S. Antarctic Research Program has increased from $12.6 million in FY 1987 to $17.0 million in the FY 1990 Current Plan, with $19.0 million requested for FY 1991. Annual changes in research funding in recent years have ranged from a slight decrease in FY 1986 (due to the Gramm-Rudman sequestration) to a maximum increase of about $2 million in FY 1989.

The Safety, Environment, and Health initiative, which receives much of the FY 1991 increase, including funding through the Operations Support program element, responds to urgent problems which have developed over many years of Antarctic operations. These include environmental activities such as expanded and aggressive clean up and retrograde of trash at current and former stations, waste disposal upgrading, and improvements in fuel storage and spill prevention. Safety and Health efforts include rework and upgrade of McMurdo, South Pole and Palmer Station facilities, improvements to field party safety and support, SAR and aircraft communications, and significant improvements to air traffic control systems. These funds are an addition to the program, not a replacement for research support.

SENATOR MIKULSKI: Last year we delayed the availability of some of the Antarctic Program's funds because we needed to save outlays and the Navy frequently never asked for NSF's funds to reimburse their costs for up to a year after they were appropriated. Why then has the Navy since then objected to this delay in the availability of funds and should the subcommittee talk to the Navy about how they handled this situation?

ANSWER: Although the FY 1990 appropriation delayed the availability of outlays, it did so by delaying our authority to enter into binding legal commitments or obligations. The Navy did not specifically object to the delayed availability of outlays, but their legal counsel argued that, in the absence of authority to obligate funds, NSF lacked the legal authority to commit itself to providing reimbursement for Naval support to the Antarctic program. Further, their legal counsel advised that funds appropriated to the Navy could not legally be used to support the Antarctic program without a binding legal commitment of reimbursement from NSF.

It may be useful for the subcommittee to consider options, for example, granting contract authority to NSF, that would ensure continued operation and support of the Antarctic program in the event of a funding hiatus or delayed availability of appropriations.

SENATOR MIKULSKI: How will NSF assure the Subcommittee the Global Climate Change environmental monitoring in the Antarctic will continue uninterrupted and with high quality? Will NSF seek assistance from experienced mission agencies, e.g., NOAA?

ANSWER: In managing and budgeting for the U.S. Antarctic Program, NSF has for many years provided support for climate monitoring activities such as those conducted by NOAA at the South Pole. To help ensure the continued high quality of such activities, peer reviews by personnel of interested agencies, such as NOAA and NASA, and academic scientists are used.

EMERGING ENGINEERING TECHNOLOGY RESEARCH

SENATOR MIKULSKI: Given the importance of promoting the development of emerging technologies in electrical and communications systems research, why are you level funding this area when the electrical and communications subactivity is being increased by 7.1%?

ANSWER: The Emerging Technology Initiation (ETI) program represents a new process for identifying and supporting emerging technologies with the potential to benefit significantly from concentrated fundamental research and infrastructure development. Representatives of industry, academia, government, and the financial community assisted in the selection of two technology areas, "Tissue Engineering" and "Microelectromechanical Engineering," for funding in FY 1988. In FY 1989 support was provided for a third technology area, "Biosensors". The total obligated for the three areas in FY 1989 and FY 1990 is approximately $1.8 million.

While the ETI program is an important experiment in identifying and supporting emerging technologies, many emerging technologies, such as biotechnology and lightwave technology, are supported within the other ENG program elements. The ECS subactivity currently has an initiative underway in optical communications, which itself is an emerging research field. At this time NSF feels that the ECS FY 1991 requested increase of $2.1 million will be more effectively utilized by increasing support for optical communications and related processing technologies than by initiating a fourth technology area within the ETI program.

INDIVIDUAL GRANT:"FOUNDATIONS OF MONETARY THEORY: MONEY AS A MEDIUM OF EXCHANGE,"

SENATOR MIKULSKI: I note that you have awarded $46,749 for the project "Foundations of Monetary Theory: Money as a Medium of Exchange." The goal of the proposed research is to develop some new theories of monetary economics, by taking seriously the notion that money is an object that helps to overcome frictions in the exchange process; that is, money is a medium of exchange. Is there reason to suspect that money is not the most effective medium (as compared to what)? How is this line of investigations relevant to NSF's mission? How will NSF use the results of the study in policy analyses?

ANSWER: This research addresses the basic question of how objects come to be used as media of exchange. Most monetary theories assume that an effective medium of exchange exists. Wright's research develops and generalizes models in which the demand for money allows for those commodities with certain intrinsic properties to be used as money or leads to the creation of fiat money, i.e., government I.O.U's as money.

A serious study on the question "what is money" is timely because of the dramatic changes taking place in the U.S. financial sector. The growth in credit, the use of electronic funds transfers and the global effects of money are having a significant impact on the U.S. economy. Recent research has shown that some of the most widely used monetary theories are seriously flawed because they assume rather than explain a medium of exchange. Professor Wright's research will provide theories that can better explain the changes taking place in the alternative forms of money in the U.S. economy and will improve our understanding of the foundations of existing monetary theories.

This investigation is relevant to NSF's mission of supporting fundamental scientific research for the betterment of society. Economists have long recognized that money is used as a medium of exchange. There is a huge literature on this subject because of the importance money has with relation to almost every aspect of economic behavior. Most monetary theories assume the existence of some form of money, however, these theories do not rigorously explain how monetary systems develop and change. Professor Wright's research could change the way economists conceptualize the role of money in the economy.

NSF is a science agency and does not expect to directly use the results of this fundamental research project on money. But advances in this area will eventually help to lay the ground work for economic policy analyses based on a more firm scientific and sound basis. The benefits of a new paradigm in monetary theory are indirect and diffused across all users of economics, hence the need for NSF to support this basic research.

INDIVIDUAL GRANT: "RECRUITMENT TO FOOD BY RAVENS,"

SENATOR MIKULSKI: Following a line of questions of several years about the behavior of birds, I note that NSF has awarded $50,000 to the project "Recruitment to Food by Ravens." The purposes of this investigation are: 1) to learn how ravens transfer at the roost the information about the location of animal carcasses, and 2) the consequences for the birds that provide the information. I am sure that this information is vital for ravens seeking any means to get through a hard winter. And it keeps the woods clean. How does it relate to the NSF mission to protect the state of the Nation's economy? What will be the application of the results of the study?

ANSWER: This research investigates the mechanisms and consequences of cooperation. Since Darwin, evolutionary theory has emphasized the importance of competition for scarce resources. The sharing of resources has been a challenging mystery. Food is a scarce resource for many animals, especially in winter. How and why ravens communicate about the location of food remains puzzling. Active recruitment to share food with strangers has not been previously demonstrated for any wild animal. This research project is testing several ideas about how ravens inform each other about the location of food and about the benefits they derive from doing so. A better understanding of this and other instances of cooperation among animals may help to provide new perspectives on human behavior as well as new knowledge on issues relevant to biodiversity. In a world of scarce resources, any possible source of insights into how cooperation can be fostered and conflict avoided should be of great value.

INDIVIDUAL GRANT:"POLITICS, CLOTH, AND ANDEAN IDENTITY IN 19TH AND 20TH CENTURY BOLIVIA,"

SENATOR MIKULSKI: I note that you have awarded $50,000 for the project "Politics, Cloth, and Andean Identity in 19th and 20th Century Bolivia." The purpose of this project is to allow a cultural anthropologist to study the political and economical significance of Andean ethnic cloth. Is this project similar to studies that have shown cowboys in south Texas wear only hats common to that area, while those in western Oklahoma wear a distinctively different style? Or is it more along the line that established Scottish families have historically identified themselves by colorful patterns in the cloth of their clothes. Is this important to anyone other than these families? Does NSF plan to use the results?

ANSWER: Rural people in the less developed world often wear "ethnic" clothing (the project studies cloth used for clothing). This project will study how the clothing functions as a marker of ethnic identity. By using ethnographic methods the project will investigate why people produce and wear unique ethnic clothing when they have the option of wearing factory-produced clothes. The research asks how this ethnic marker helps people defend their ethnic separateness. Understanding how ethnic identity functions in opposition to state policies is extremely relevant today, in light of the resurgence of ethnic hostilities in Eastern Europe. It is likely that mechanisms such as ethnic cloth production underlay the maintenance of ethnic identity, and so the results of this project in the Andes may be relevant to understanding political, social, and economic problems across the world.

INDIVIDUAL GRANT:"STUDIES IN THOUGHT SUPPRESSION"

SENATOR MIKULSKI: I tried not to think about this project, but I cannot forget that NSF has awarded $137,903 for the project "Studies in Thought Suppression." The purposes of this investigation appears to be how self-distraction operates ("Though suppression may make an unwanted thought more easily brought to mind, ...") and the consequences of thought suppression. Is this an important area for NSF? Does NSF plan follow-up work on alternatives to suppression of disagreeable thoughts? Considering the need to fund "pipeline" and infrastructure problems, what priority does this research area have? Anyone in need of this study's result?

ANSWER: This research explores the nature of thought suppression, and its effects on subsequent behavior. Thought suppression may lie at the root of obsessive behavior and if so, this research project has implications for understanding the nature of obsession. In addition, the research is relevant to the understanding (and ultimate treatment) of depression, phobia, alcohol and drug addiction, and eating disorders. In each of these problem areas, the suppression of unwanted thoughts is a common strategy that people use to try to cope with their unwanted emotions and/or self-destructive behaviors. This strategy often backfires, and promotes the very difficulties that it was designed to offset.

A complete scientific analysis of thought suppression is crucial to understanding these issues. Given the ubiquity of thought suppression, and its potential impact on a host of behaviors, is relevant to NSF as we try to understand human behavior.

INDIVIDUAL GRANT:"THE RELATION BETWEEN CONSISTENCY AND ACCURACY OF EYEWITNESS TESTIMONY,"

SENATOR MIKULSKI: I note that NSF has funded at $74,223 the project "The Relation between Consistency and Accuracy of Eyewitness Testimony." The purpose of this investigation is "... to examine the relationship between eyewitness consistency and accuracy through undertaking three laboratory experiments." The investigators' hypothesis is that the relationship between accuracy and consistency will vary. Don't people with at least average intelligence already know that as a result of their personal experiences? Is there a need to demonstrate this in a laboratory? Considering the need to find "pipeline" and infrastructure problems, what priority does this research area have? Anyone in need of this study's result?

ANSWER: The results of basic social science research have been applied to policy and practice at a number of levels within the criminal and civil justice systems. The jury trial is a significant social institution and therefore understanding the way in which it functions is of which great importance. There is no empirical evidence, however, to support the assumption that inconsistent recollection implies inaccurate memory. On the contrary, some pilot studies show the relation between consistency and accuracy to be negligible.

Judges, lawyers, and jurors generally believe inconsistency reflects inaccurate testimony. Witnesses who contradict themselves are assigned lower credibility. As a result, the witness's testimony is often rehearsed in the presence of his or her counsel. Counsel will prepare the witness for the questions that are likely to be posed in the courtroom, in order that the rehearsed answers will be elicited. The premise being that such rehearsal should increase the consistency of testimony. However, this project hypothesizes that rehearsing testimony may have little effect on its accuracy. The experiments in the study are designed to test this hypothesis. The results could have far reaching theoretical and practical significance in the legal system. In addition, the information obtained should contribute greatly to the scientific understanding of the basic processes involved in memory retrieval.

This project was funded with support from the initiative on Research in Undergraduate Institutions (RUI). The project involves faculty and undergraduate students who are not often in the mainstream of scientific research. This addresses the "pipeline" problem by providing the students with the opportunity to contribute to scientific research and thereby promote the quality of undergraduate training for graduate study and careers in science.

RESEARCH CENTERS

SENATOR MIKULSKI: For a few years now NSF has expanded its focus on supporting new research centers--engineering centers, science and technology centers, supercomputer centers, etc. These are undoubtedly somewhat risky ventures. I would expect that the Foundation would have some very good success stories as well as some disappointments. What has been the Foundation's experience thus far in supporting new research centers? What are we getting as a Nation for these efforts?

ANSWER: In general, the Foundation has been very successful in its support for research centers. Science is a risky enterprise, and results are often unpredictable, but centers are no more or less risky than other forms of support.

Fortunately, we have had many more success stories. The NSF Centers -- including Engineering Research Centers (ERCs), Industry/University Cooperative Research Centers (IUCRCs), Science and Technology Centers (STCs), and Minority Research Centers of Excellence (MRCEs) -- emphasize specific research areas using an interdisciplinary approach. Areas of research include a rich mixture of activities. Industry participation and technology transfer are important features of the various centers.

These centers also have a strong educational component. They are attempting to increase the participation of women, minorities, and underrepresented groups in science and engineering, and play a major role in ensuring the requisite pool of scientists with the quality and breadth of experience needed to meet the changing needs of science and society.

Although the eleven STCs are only one-year old, some major accomplishments already have been achieved. For example:

- At the University of Oklahoma's Center for Analysis and Prediction of Storms, an atmospheric prediction model has been successfully modified that can be used in local areas in which large atmospheric changes are occurring. This may lead to improved regional predictions of severe weather.
- At the California Institute of Technology a computer chip and software have been developed that will make possible the analysis of large data bases, such as the 25 million units of sequence information about humans and other organisms.

The Foundation currently supports six Minority Research Centers of Excellence. The MRCEs strengthen the capability of research active minority institutions, enhancing their ability to contribute to the advancement of knowledge and attracting minority students to science and engineering. As an example, the MRCE at Howard University is developing a nationally recognized facility for research on gallium arside and silicon carbide, two materials that have widespread use in a number of new technologies.

The Foundation's Engineering Research Centers provide a unique environment where faculty and students collaborate with industry personnel to advance engineering knowledge and technology. Industry participants support the ERCs and become involved in their planning, research, and education programs because they believe that the ERCs will have a long-term impact on the competitiveness of their firms and their industries. The ERCs focus on long-term, high-risk research with a strong potential to contribute to technological advancement. For example:

- Poor joints in undersea oil pipe can create serious pollution from oil seepage. Research at the Texas A&M/Texas Offshore Technology Research Center has resulted in the adaptation of a technique called homopolar pulse welding for rapid, high quality poining of pipe.

- A collaborative project between a student from the Carnegie Mellon Engineering Design Research Center and a DuPont engineer has resulted in a new algorithm that is a major improvement in large scale scheduling programs for production and distribution. DuPont estimates that the new program has resulted in a $3.5 million saving in the first year of use.

The Industry/University Cooperative Research Centers encourage highly leveraged industry/university cooperation by focusing on fundamental research defined by groups of firms supporting the centers. NSF acts as a catalyst for these centers. The Foundation's budget for this program is less than $4 million in FY 1990, but the total support from all sources for these centers is in excess of $50 million per year. Several examples of their achievements include:

- The Industry/University Cooperative Research Center for Advanced Steel Processing and Products at the Colorado School of Mines focuses research on formability and properties of flat rolled steel. Researchers at the Center have developed new processing techniques that can produce "as forged" parts with twice the strength and six times the toughness of conventional microalloyed steels. A Texas steel mill is now marketing these forgings at a 20% cost savings over conventional materials.

- The New Jersey Institute of Technology's Industry/University Cooperative Research Center for Hazardous and Toxic Substances represents a consortium of five New Jersey academic research organizations that carry out research on the management of hazardous and toxic materials to make them environmentally safe. Research at this Center provided the basis for a paint company to save over $1 million per year by dewatering its toxic paint waste residues to reduce removal and treatment costs.

But, you are correct when you say we have had some disappointments. Not only have we had to shut down some centers, three Engineering Research Centers and several Materials Research Laboratories over the past few years, but we have also shut down some very interesting facilities as well, such as the Aladdin Project at Wisconsin Synchrotron Radiation Center in the mid-1980's.

SENATOR MIKULSKI: There has been much discussion concerning the impact of large science projects, such as the Gravity Wave Observatory, on the support for individual scientists working in small groups consisting of a senior scientist, a post doc and a graduate student or two. What has happened to that portion of NSF support in the physical and mathematical sciences for individual grants as a result of the decisions to start new research centers and other major equipment projects like the Gravity Wave project?

ANSWER: The Foundation has maintained and continues to maintain a balance between individual investigator awards and awards for larger projects, including construction of major instruments. For example, the percentage of the Research and Related Activities (R&RA) budget devoted to large projects has remained relatively stable over the years, indicating that these larger projects have generally not been supported at the expense of individual investigators. This situation is generally true in the mathematical and physical sciences as well, where the fraction of the budget used for projects such as centers and facilities has remained steady over the last few years.

Large facilities, which are used primarily by individual investigators, are crucial for maintaining our science and engineering preeminence and for attracting young people into science and engineering. For researchers in observational or experimental fields such as astronomy or physics, access to facilities is as integral to "individual" research as any other component of support.

SENATOR MIKULSKI: What is the overall percentage of the NSF budget that goes to support research centers and how does that compare to previous years? Why do you believe centers are so valuable as part of the way in which basic research is conducted? How do centers contribute to education and training and the creation of new knowledge? What is your long term plan for additional new research centers?

ANSWER: The NSF Centers -- including Engineering Research Centers, Industry/University Cooperative Research Centers, Science and Technology Centers, and Minority Research Centers of Excellence -- emphasize specific research areas using an interdisciplinary approach. Areas of research include a rich mixture of activities. Industry participation and technology transfer are important features of the various centers. Approximately 8% of the FY 1991 Budget Request for Research and Related Activities goes to fund centers, an increase from 6% in FY 1988 and 7% in both FY 1989 and FY 1990.

These centers have a strong educational component. They are attempting to increase the participation of women, minorities, and underrepresented groups in science and engineering, and play a major role in ensuring the requisite pool of scientists with the quality and breadth of experience needed to meet the changing needs of science and society.

As stated in the Foundation's Long-Range Plan for FY 1989-1993, NSF expects to have established 80-100 centers by FY 1993 if the proposed doubling of the NSF budget occurs.

8-METER OPTICAL TELESCOPES

SENATOR MIKULSKI: The Committee last year asked NSF to report on the efforts to obtain international contributions to finance a pair of new 8-meter optical telescopes. Now we have a request in the FY 1991 budget of $4 million to move forward with this large-scale piece of instrumentation. What is the current status of the efforts to attract international contributions, and should we go forward with this project if international contributions are not forthcoming?

ANSWER: The FY 1991 request contains $4 million to support the final design of the telescopes and to purchase glass for the first 8-meter mirror. On this schedule, the first telescope would be completed in 1997 and the second in 1999. The National Optical Astronomy Observatories (NOAO) has submitted a proposal for two 8-meter telescopes, one to be located on Mauna Kea in Hawaii and the other on Cerro Pachon in Chile. The proposal is currently under extensive review by the astronomical community.

As we stated last year, in light of the number of potentially excellent major science projects and the present limitations on funds, the National Science Foundation (NSF) has been exploring the opportunities for collaborating with other countries on some major projects. The 8-meter telescopes are attractive candidates for such cooperative ventures because of their high scientific merit and because all agree that major telescopes should go on the best possible sites. NSF and NOAO have been actively discussing such a collaboration with our counterparts in the United Kingdom and Canada. This partnership was recommended by a seven-country Joint Working Group on Ground-based Astronomy last year. It has been enthusiastically endorsed by the Associated Universities for Research in Astronomy, Inc. (NSF's contractor for NOAO) and by the Canadian Astronomical Society. The selection process within the United Kingdom is nearing a recommendation. We are encouraged by the progress of discussions with both potential partners.

NSF's planning is based on providing 50 percent of the cost of the two 8-meter optical telescopes as proposed by NOAO. Should the proposed international collaboration with the United Kingdom and Canada not materialize, we will seek other partners or consider scaling back the total project. However, any substantial reduction in scope of the project would seriously impact the competitive position of U.S. astronomy in the next decade. We regard the scientific case for this class of telescope to be very compelling, as evidenced by similar activity throughout the world. It is also scientifically important to have national access to a large telescope in each hemisphere, particularly given the all-sky coverage that upcoming NASA astronomy missions will provide.

We should go forward with the design and purchase of glass for the first mirror in FY 1991 as access for the U.S. national community to telescopes of this class is essential at the earliest possible date for our scientific competitiveness.

GREEN BANK TELESCOPE--STATUS

SENATOR MIKULSKI: Last year the Congress appropriated a total of $75 million for the replacement of a 300-foot radio telescope at the Green Bank Observatory. What is the current status of that project?

ANSWER: Associated Universities, Inc. (AUI), the contractor for the National Radio Astronomy Observatory (NRAO), submitted a proposal for the construction of the Green Bank Telescope (GBT) in June 1989. The proposal was peer reviewed, and the National Science Board (NSB), in October 1989, approved $4,140,000 for design study and definition of parameters.

In December 1989, NRAO published, in the Commerce Business Daily, an announcement of intent to build the GBT and invited companies to indicate their interest in the construction. All interested parties currently receive material to keep them informed on design developments. It is expected that NRAO will issue a formal call for proposals for the final design, fabrication, and assembly of the telescope in June 1990. When the cost estimates and design parameters are clear, the NSB will be asked to approve the construction.

Award of a contract is expected in the spring of 1991 at which time long-lead items will be purchased and the detailed time schedule worked out. Site work will begin in 1991, manufacture of the antenna in 1992, and assembly and erection is planned for 1993-1994. The telescope, after testing, will become operational in 1995.

SENATOR MIKULSKI: Last year, the Committee urged that staffing levels at Green Bank be maintained at current levels. Where do we currently stand in that regard?

ANSWER: NRAO's personnel level for the operation of the Green Bank site will be kept constant, with additions for construction work.

COMMITMENT TO UNDERGRADUATE INSTRUCTION AND MINORITIES

SENATOR MIKULSKI: Last year we discussed the issue of raising the visibility and prestige within institutions in the area of teaching and also attracting women and minorities into these institutions of higher education. You talked about meeting with a number of university presidents and said to the Committee that you called these presidents together to discuss the issue of women and minorities both in their faculty, administration, and student body and to make sure they understood NSF's desire to see the institutions increase their efforts in that regard. Would you comment on what has happened since your initial session with these university presidents?

ANSWER: The Foundation held three meetings with the Presidents of the top-20 NSF-funded institutions. Subgroups were formed and recommendations for action, to be taken by universities, were made for precollege science and mathematics education improvement; enhancement of minority and women undergraduate and graduate student retention; research career initiation and enhancement for women and minorities; and the development of alliances to strengthen program activities across institutions and organizations. We expect to issue a press release highlighting the recommendations to be adopted by the major research universities in late spring.

HIGH PERFORMANCE COMPUTING

SENATOR MIKULSKI: Last year, the Office of Science and Technology Policy issued an interagency High Performance Computing plan. This plan called for a major expansion in federal support and activities in a variety of areas related to high performance computing. Yet the overall federal request for high performance computing increased by only 5% over last year's level. What is NSF proposing in the area of high performance computing for FY 1991?

ANSWER: The OSTP High Performance Computing Plan addresses four areas: 1) HPC Systems; 2) Advanced Software Technology and Algorithms; 3) National Research and Education Network; and 4) Basic Research and Human Resources. The NSF is actively engaged in supporting all four of these areas.

In FY 1991 the NSF investment in the first area, HPC Systems, would be about $22 million, of which new programs in response to the OSTP report total $3 million; the FY 1991 investment in the Software area (which includes scientific applications and computing facilities such as the National Supercomputer centers) is proposed to be $105 million, and new programs are $2.3 million; the base in the networking area is proposed at $31 million, with new focused programs totalling $9 million; and the proposed FY 1991 base for basic research and human resources is $21.6 million. The total NSF investment proposed for FY 1991 in high performance computing would be $179.6 million. Unfortunately, the HPC report was not available in time for it to be widely incorporated into internal and interagency planning. However, we expect the report's recommendations to be better reflected in the 1992 budget.

BIOTECHNOLOGY

SENATOR MIKULSKI: To what extent is NSF supporting research in the area of biotechnology? With NIH and other federal agencies (USDA, etc.), how well coordinated are federal research efforts in biotechnology?

ANSWER: "Biotechnology" refers to the application of modern molecular biology and genetics to direct, enhance, or "engineer" the production of products using biological systems-- from single enzymatic processes to entire higher plants with special characteristics. In FY 1989, the NSF awarded $118.5 million to 2,198 projects related variously to biotechnology. This represented 3.7% of the total U.S. investment of $3.5 billion. The NIH investment accounted for 83.5% and was mostly in the area of biomedical applications.

Federal research efforts in biotechnology are best coordinated in the context of specific activities. Other agencies, when appropriate, are invited to participate in the review of large, integrated activities, as well as regular panel meetings. NSF has liaison membership on relevant review and policy-making committees with USDA and NIH. High-level officials from NIH, DOE, and USDA are _ex officio_ members of the Directorate Advisory Committee for the Biological, Behavioral and Social Sciences. Relevant programs are also regular participants in reviews of counterpart activities at the Office of Naval Research. These activities provide a comprehensive and timely opportunity to coordinate activities as needed.

ANTARCTIC PROGRAM

SENATOR MIKULSKI: In the Antarctic program, the logistical backbone of the program are the Foundation's fleet of LC-130 ski-equipped aircraft. Last year the Committee requested the Foundation to submit a report assessing current and future aircraft needs in connection with the program. That report noted that two additional aircraft will be needed to supplement the existing fleet to meet future program requirements in the latter part of this decade. How well did the current fleet of aircraft perform during this most recent season? To what extent did you experience unusual delays that could be attributed to problems with the aircraft?

ANSWER: Delays attributable to aircraft difficulties were greater this year than last. Unusually severe weather and the communications difficulties resulting from high solar activity in the first portion of the season contributed to the difficulties. Resulting delays were compounded by decreased availability of LC-130 aircraft due to maintenance problems. While the availability of LC-130s was reduced compared to previous years, availability of the also-aging UH-1N helicopters was significantly improved. The Navy is taking measures to improve LC-130 availability for next season.

SENATOR MIKULSKI: Given the unique nature of the Antarctic research program, it is not surprising that the costs of logistics and other support services far exceed the amount of resources that actually go to support the conduct of research. What have been the support trends in this program for research v. logistics. Are there important research opportunities in such areas as global change that we are missing because more and more resources are being applied to logistical support?

ANSWER: Funding for science in Antarctic has been maintained at a relatively constant proportion of the total program. Examination of trends from FY 1981 to FY 1991 shows that research grants funding has decreased from 13% to 11% of the USAP total. However, during the same period direct support of science -- research ships, aircraft and contractor support -- for research projects has increased from 13% of the total to 16%. So, science including its necessary direct support is in good shape. If other factors are taken into account, such as construction of a major science laboratory at McMurdo (2.7% of the USAP FY 1991 Budget Request), the treatment of science appears still more favorable.

While increases in funding of research projects will be needed in the future for global change and related efforts, the FY 1991 Budget Request helps provide logistics and facilities that will support this increased research. Further, one of the objectives of the Safety, Environment and Health initiative is year-round access to Antarctica at acceptable risk, which will increase research opportunities.

PUBLIC CITIZEN PETITION--NSF MERIT REVIEW PROCESS

SENATOR MIKULSKI: Last year NSF was petitioned by the Public Citizen to make significant changes in the NSF review and reconsideration process to improve its openness and accountability. What has been the Foundation's response to this request and other calls to clarify and improve the merit review process?

ANSWER: On March 12 NSF's General Counsel responded to the Public Citizen petition in considerable detail. A copy of his letter is attached for the Committee's use. In parallel, the NSF conducted a separate reexamination of its review processes that I had initiated. The two processes were pursued under different leadership and pursued similar directions but each took up issues that the other did not. The process I initiated resulted in additional and rather more sweeping changes to clarify and improve the merit review process. Those changes are summarized in the a Notice I plan to send to institutions interested in NSF programs and procedures. I will make a copy available to the Committee as soon as it in final form.

OFFICE OF SCIENTIFIC INTEGRITY

SENATOR MIKULSKI: Last year, the Committee asked NSF to consider the feasibility of establishing an office of scientific integrity. Mr. Bloch, would you elaborate on the rationale on the Foundation's view that an office such as this is not necessary?

ANSWER: NSF shares the concern of the Committee that a strong means of detecting scientific misconduct in the grants process should exist. In responding to the recommendation that NSF report on the possibility of establishing an Office of Scientific Integrity , the NSF determined that a separate office would be unnecessarily duplicative.

The rationale for this view is that the Foundation has examined the roles of the various offices responsible for investigating and resolving scientific misconduct issues and determined that adequate oversight and controls exist in the Foundation's current organizational structure. The recently established Office of Inspector General investigates complaints regarding alleged misconduct, oversees investigations of scientific misconduct by grantees, performs audits and conducts independent NSF investigations when appropriate. After the completion of an investigation, the Office of the Director, which includes the Office of General Counsel and the Senior Science Advisor, as well as the Director's Office itself, hears evidence and resolves disputes regarding scientific misconduct. Appropriate corrective or disciplinary action is initiated when misconduct is found. This distribution of responsibilities within NSF has proven to be both effective and efficient for the Foundation.

While we feel strongly that efforts to ensure scientific integrity are vital to a healthy scientific research effort, existing NSF offices effectively facilitate the detection, investigation, and resolution of scientific misconduct allegations under NSF grants. As in the past the NSF will continue to be in the forefront of efforts to foster the responsible conduct of science.

QUESTIONS SUBMITTED BY SENATOR LEAHY

SENATOR LEAHY: I believe that the Administration has waffled on taking actions to stabilize the emission of greenhouse gases. Yet in its November 7, 1989 statement on the Noordwijk Conference on Atmospheric Pollution and Climate Change the White House stated:

"President Bush...has agreed with other industrialized nations that stabilization of carbon dioxide (CO2) emissions should be achieved as soon as possible."

I would much prefer to see a policy of reduction of greenhouse gases, but for this Administration, a policy of stabilization would be a step in the right direction.

In your view, Dr. Bloch, when is the U. S. going to set a time certain for beginning work on stabilizing CO2 emissions? The President has already agreed to stabilize CO2 emissions!

ANSWER: I can not say precisely when actions may be taken to stabilize CO_2 emissions, and it is not a decision for NSF to make. However, as you point out, the U. S. has agreed that industrialized nations should stabilize CO_2 emissions. To facilitate this the U. S. is now developing a national policy addressing climate change and has initiated discussions to promote international consensus about possible response measures to climate change. On April 17 and 18 President Bush hosted the White House Conference on Science and Economic Research Related to Global Change. This international conference brought together Ministerial-level representatives from twenty countries to examine scientific and economic issues relevant to policy on global change in an effort to identify the data and methods required for the development of international policy on climate change. To facilitate the negotiation of an international framework for a convention on climate change, the President has offered to provide a venue for the first session of the convention later this year.

SENATOR LEAHY: In 1989, I wrote a provision addressing global warming into the foreign operations appropriations bill. Very simply, it directs the Agency for International Development to get serious about helping developing countries reduce activities that contribute to global warming. Targeted are "key" countries like India, Brazil and Mexico.

Is any of the work of the NSF aimed at supporting energy and forestry conservation overseas?

ANSWER: While the National Science Foundation's role is to support basic research, it is cognizant of the need to support the conservation of biological diversity, especially in tropical forests. Forest conservation, including preservation of species and natural habitats, is one of the best ways to foster energy conservation and to reduce the release of greenhouse gases that have been implicated in global warming.

NSF has just completed review of proposals for its first competition in Conservation and Restoration Biology. Approximately 150 proposals were received, and the Foundation expects to make about $2 million in awards. Several of the awards will be for forestry conservation and restoration projects in developing countries.

SENATOR LEAHY: Have AID officials contacted you or your staff about coordinating their efforts with yours?

ANSWER: The AID appropriation for Fiscal Year 1990 required that $1 million be passed through to NSF to be used for research and infrastructure development related to biodiversity in AID-relevant countries. NSF and AID have convened an interagency steering committee to oversee the disbursement of the pass-through funds. The steering committee is also examining the possibility of implementing an ongoing interagency funding initiative in biodiversity in subsequent years.

SENATOR LEAHY: Do you agree we should be doing more in these key countries? Is there a role for the NSF in this effort?

ANSWER: The recent report of the National Science Board, "Loss of Biological Diversity: A Global Crisis Requiring International Solutions," recommends that NSF assume a leadership role in the following areas:

- producing a global inventory of biodiversity
- fostering interdisciplinary research projects involving biologists and social scientists in addressing the underlying biological, social and economic causes of loss of biodiversity

- further developing the scientific basis for conservation biology and restoration ecology

- working with other Federal agencies to aid scientists, students and institutions in developing countries in analyzing and preserving their own biodiversity

A new panel on biodiversity studies will be initiated in 1991 to focus on interdisciplinary projects involving ecologists, systematists, and social scientists working on biodiversity inventories.

SENATOR LEAHY: In FY 1990, for the first time, appropriations for the Academic Research Facilities Modernization Act were passed by the Congress and signed into law. What is the Administration's request for this program for FY 91? Do you consider this adequate to meet the well-documented need?

ANSWER: The Administration's request for this program for FY 91 is $20 million. This figure is in keeping with the Congressional appropriations process and the accompanying Conference Report that limit the FY 1991 and FY 1992 budgets for this program. The Conference Report on the FY 1990 appropriation for NSF states that "The conferees agree that the $20,000,000 provided for this activity in fiscal year 1990 shall be maintained as the maximum program level during fiscal years 1991 and 1992."

An NSF competitive grants program is only one mechanism for supporting research facilities. Other possible initiatives include: targeted programs in various agencies with appropriate funding; modification of the federal cost principles with regard to use allowances, depreciation, and other facility-related costs; and removal of or increase in the $150 million cap on tax-exempt bonds.

SENATOR LEAHY: What is the status of the competition for the FY 90 funds under this program?

ANSWER: The Program Solicitation was released in January, 1990. Panel meetings were held April 1-3, and the Research Facilities Office is in the process of evaluating the panel recommendations and making final decisions on what institutions will be invited to submit a Phase II proposal. Proposers will be notified in early May as to whether they will be invited to submit Phase II proposals.

The number of Phase II invitees and awardees depends on panel input and NSF consideration of such factors as type and size of institution, need for geographic balance, assurance that a minimum of 12% of the available funds go to Historically Black Colleges and Universities (HBCU) and minority institutions, and funding proposed vs available program dollars.

SENATOR LEAHY: How many applications have been received? How many do you expect to approve?

ANSWER: In response to the Program Solicitation, 424 Phase I (preliminary) proposals requesting over $318 million were submitted.

SENATOR LEAHY: How many of these applications are from Vermont, and who are the Vermont applicants? I believe that this is an important program that meets greatly deferred needs.

ANSWER: Four proposals were received from organizations in Vermont. Names of proposing organizations are not made public in order to protect the privacy of those organizations.

SENATOR LEAHY: Report language that was included in the FY 1989 appropriations law including the NSF directs you to initiate a vigorous program of Arctic social science research, as mandated under the Arctic Research and Policy Act of 1984.

I am pleased to see that such an initiative is included in the Administration's FY 91 NSF budget request. How many NSF staffers will be working in this area, and what do you expect to achieve by the end of FY 91? Is this proposed as an ongoing initiative?

ANSWER: NSF has hired a full-time program director to manage this new program and organize interagency social science coordination. He will receive assistance from other NSF staff as necessary including over 50 FTE engaged in other facets of Polar Programs. The social science program in DPP will be fully operational in FY 1991, as will the Interagency Arctic Social Science Task Force chaired by this program director. Benefits of research supported can be expected over the long term, as this program will be ongoing. Proposals are not yet submitted, it is too early to assess the research directions which the community may propose.

SENATOR LEAHY: As you may realize, I have been a strong supporter of the EPSCoR program. Is the level of funding requested by the Administration in this area sufficient to allow the existing EPSCoR programs to operate at their FY 90 level--that is, with sufficient funds to cover inflation? If not, how will this effective cut in support impact their operations?

ANSWER: The level of NSF support in FY 1990 for the seventeen EPSCoR participants was $10 million. The FY 1991 budget request, also $10 million, is based upon the requests submitted by the participating states for the conduct of their ongoing programs. This amount will be adequate, in spite of inflationary pressures, because the design of state EPSCoR budgets incorporates non-federal contributions from state government and institutional contributions that assume a greater share of the financial responsibility for the overall program costs. This approach is consistent with the EPSCoR philosophy of the NSF acting as the "stimulus" for improvement, with the ongoing costs of the improvements ultimately borne by the participating states.

SENATOR LEAHY: The Vermont program is presently in the fourth year of its five year grant cycle. Based on performance to date, what are the prospects for the Vermont program beyond year five in terms of participation in what might be called "Phase 2" of EPSCoR? Do you contemplate pursuing a "Phase 2", and do you foresee Vermont as a likely participant?

ANSWER: The Vermont EPSCoR program is making satisfactory progress and will, pending the availability of funds, receive NSF support in the amount $327,165 for the fifth year of their grant. The NSF will assist the seventeen participant states, including Vermont, to prepare for the EPSCoR Advanced Development Program proposed for FY 1992. Vermont has received a copy of the program solicitation and is beginning to prepare a state-wide Advanced Development Proposal. Representatives from the state of Vermont have been invited to attend an informational meeting to be conducted by the NSF program staff during the week of May 14, 1990. Vermont is eligible to submit a proposal requesting three years of NSF support at a level of $1.5 million per year. The deadline for proposal submission is January 15, 1991. At present State leaders indicate that they will submit an Advanced Development proposal on behalf of Vermont.

QUESTIONS SUBMITTED BY SENATOR KERREY

NSF IN THE FEDERAL GOVERNMENT

SENATOR KERREY: We see a lot of research and increasing education efforts being supported throughout the government -- DOD, DOE, NASA, etc.

Do you see this as a positive approach, with each department or agency pursuing activities in the areas which most directly affect it?

What do these trends tell you about NSF's future?

What do you see as NSF's role in coordinating or supporting these activities?

ANSWER: NSF has consistently maintained that the mission agencies have a role in the investment into this nation's science and engineering enterprise. This includes supporting the people they need to meet their own supply and demand, e.g. through fellowships or traineeships. It includes supporting the basic and applied research that underpins their mission. And, it includes supporting the instrumentation and equipment necessary to further basic and applied research efforts in the research areas they rely upon to carry out their mission.

NSF has worked in the past, and will work in the future, with the mission agencies to further the development of this nation's science and engineering enterprise. The President's Office of Science and Technology Policy is moving aggressively to put in place coordinating mechanisms to support this range of activities.

YOUNG SCHOLARS PROGRAM

SENATOR KERREY: Your budget justification indicates that you expect to reach about 4,500 high school juniors and seniors with the Young Scholars Program. What will be the basis for these awards and will there be a geographical distribution?

ANSWER: The Young Scholars program supports science and/or mathematics enrichment projects which offer career exploratory activities for students entering grades seven through twelve. NSF does not select individual project participants. Interested students apply to the project(s) of their choice and participants are selected by project staff based on established eligibility requirements.

Project awards are made based on established NSF merit review procedures, with proposals judged on the merits of the activities proposed. We also attempt to maintain a balance with respect to discipline focus and geographic distribution.

The Young Scholars Program was initiated in 1988. In FY 1989, the program made a total of 69 new awards that were distributed in 34 states, DC and Puerto Rico.

SENATOR KERREY: How many young scholars have you had in the past?

ANSWER: The program supports two-year continuing awards. In FY 1988, the first year of program operations, with a budget of $3.5 million we funded 68 projects which served approximately 2,400 students in Summer 1988. In FY 1989, with a budget of $7.0 million, we funded 69 new projects and the second year of operations for the 68 1988 awardees. These 137 projects served approximately 4,700 students in Summer 1989. For FY 1990, with a budget of $7.0 million we have funded a total of 131 new and continuing awards, which are expected to involve a minimum of 5,000 students in Summer 1990.

NSFNET

SENATOR KERRY: What is your total request for NSFNET in fiscal 1991?

ANSWER: The request for NSFNET is $22.0 million for Fiscal Year 1991.

SENATOR KERRY: You have a $9 million increase for NSFNET. Does this represent an upgrading of current capability or the addition of institutions to the network?

ANSWER: The increase requested for the Networking and Communications Research and Infrastructure Subactivity is $9.1 million; of that, $6.1 million is the requested increase for NSFNET. The increase will fund competitive proposals for connection of additional institutions, upgrade the current network, and provide enhanced service to users.

SENATOR KERRY: What type of support do you expect to be available to the Nebraska component?

ANSWER: The State of Nebraska has two institutions on NSFNET: the University of

Nebraska-Lincoln and the University of Nebraska-Omaha; the University of Nebraska-Lincoln site also serves as one of the 13 backbone nodes on the NSFNET Backbone. The four state colleges and Nebraska Wesleyan have expressed interest in connecting to NSFNET, as have some Natural Resource Districts and private companies. The NSFNET is open to any qualified institution that wishes to connect; NSF has funds for such connections, and uses its proposal review process to make awards.

SENATOR KERRY: Is your goal over the next several years an expansion of the network or greater capacity within the network?

ANSWER: A principal goal is to extend the network's reach to more institutions; accompanying increases in capacity will be necessary to handle the increasing traffic due both to the increasing number of users as well as to increasingly demanding and complex transactions and applications carried by the network.

SENATOR KERRY: In NSF's view what are the current major omissions in the networking system?

ANSWER: The networking system as a whole is relatively young and rapidly evolving. Tools for the technical management, and organizational arrangements for the social and economic management of the complex internet, with its distributed ownership and authority, are still primitive. Thus, correcting network problems and/or solving user complaints remain excessively labor-intensive, expensive, and slow. Directory services are not universal. It is difficult for users to discover the network addresses of colleagues and of other network resources. There is much R&D to be done to make the network easier to use for a wide range of useful applications. Finally, although the past two years have seen major advances in reach, capability, and reliability, there is a long way to go to reach all of the education and research institutions that could benefit from interaction over the net.

ENGINEERING EDUCATION COALITIONS

SENATOR KERRY: NSF has issued a program solicitation for Engineering Education Coalitions under which it expects to support 3 coalitions at $2-3 million per year for up to 5 years. Because of the need to attract women and minorities to science and engineering, will an effort be made to support broad-based coalitions which serve a broad range of people?

ANSWER: Yes. The central objective of the coalition program is to "increase dramatically the quality of U.S. undergraduate engineering education as well as the number of engineering degrees awarded, especially to women and underrepresented minorities." As a requirement for eligibility, the schools in each proposed coalition must have a proven track record of serving underrepresented students by having awarded at least 300 degrees to minorities who are underrepresented in engineering and 600 degrees to women, based on a yearly average for the three calendar years 1987-89. In addition, the activities proposed for funding must include plans for increasing the participation of women and underrepresented minorities in their engineering schools.

SENATOR KERRY: How will proposals be reviewed?

ANSWER: The above criteria will be applied in a two step process. First proposals will be read by a distinguished panel of engineering educators and industry leaders. Then the finalists will be interviewed in person by a smaller set of panelists. Women and underrepresented minorities will be panelists to assure that the perspectives of these groups are served in the coalitions which are recommended for funding.

ACADEMIC RESEARCH FACILITIES PROGRAM

SENATOR KERREY: Congress in FY 1990 added $20 million for the academic research facilities program. NSF selected a group of institutions to compete and, I understand, indicated that it would accept one application for each of these institutions. How many applications do you expect to fund and what do you expect the size of the grants to be?

ANSWER: The program is being conducted in two phases in order to facilitate and manage the proposed evaluation process efficiently and effectively. It is anticipated that award decisions will be made between September and December, 1990.

Phase I received 424 proposals, requesting over $318 million. The requests ranged from $7,000 to $7 million; the average request was $725,000. At this time we are unable to predict the numbers and size of awards as we are now in the process of selecting those organizations that will be invited to submit Phase II proposals.

The number of Phase II invitations is being determined by panel review evaluations. Awards will be granted based on evaluation criteria - research merit, facility need, project impacts, and plans, and funding. Additional considerations include size and type of institution, geographical balance, a minimum of 12% of funds going to Historicaly Black Colleges and Universities (HBCU) and minority institutions, and available program dollars.

SENATOR KERREY: Is there a geographical formula or will any effort be made to insure a geographical distribution?

ANSWER: In addition to four evaluation criteria -- research merit, facility need, project impacts, and plans and funding -- NSF must consider, by law, the equitable distribution of funds among organizations of different sizes and geographic locations in making awards under this program.

SENATOR KERREY: Colleges and universities presumably select their highest priority projects. Do these simply compete against each other once they are submitted?

ANSWER: For the purposes of competition, review, evaluation, and final rankings, eligible organizations are divided into three groups based on the average annual amount of NSF research funds received by the organization. This grouping makes it possible for organizations to compete against other organizations that are similar in terms of the amount of funds received from NSF. A percentage of program funds is targeted for each group. The dollar ranges for the three competitive groups and the target award percentages for each helps assure that major research institutions, as well as emerging, developing, and historically underfunded institutions have an opportunity to receive significant funding under the program.

SENATOR KERREY: If you receive a FY 1991 appropriation of $20 million, what criteria will you use for determining which institutions can submit applications?

ANSWER: Based on the relatively high cost of research facilities renovation, the proposal preparation and review process, and the anticipated proposal pressure, proposals submitted in response to the current Program Solicitation are competing for the combined FY90 and FY91 funds, a total of $40 million as indicated in the 1991 budget. There is no change in criteria.

SENATOR KERREY: Do you currently have an estimate of the total need for facilities renovation and modernization?

ANSWER: According to Scientific and Engineering Research Facilities at Universities and Colleges: 1988 (NSF 88-320), the estimated cost of needed facilities renovation and modernization for 1988-89 was $3.6 billion. Of this total requirement, $777 million was spent for renovation in 1988-89, using funds from various sources.

SENATOR KERREY: Do you foresee any funding for construction or renovation at small, private institutions in the near future?

ANSWER: The Academic Research Facilities modernization program is primarily for rehabilitation, renovation and repair of existing facilitites. Only under special circumstances will new construction be considered.

Small, private institutions which are included in the program's Group III category, are expected to receive 20 - 30 percent of the program's funds.

CENTERS OF EXCELLENCE/BOOTSTRAP AWARDS

SENATOR KERREY: The science and math education bill introduced by Senator Kennedy includes a program of Bootstrap awards which are, I understand, based on an old NSF program called Centers of Excellence.

a) What were the criteria for the Centers of Excellence Program?

ANSWER: NSF's Institutional Science Development program, informally known as "Centers of Excellence", awarded $233 million to 104 universities during its eight year lifetime (1964-72). According to NSF's FY 1969 Budget Justification to the Congress, the program's primary goal was to "assist higher education institutions of less than top quality in science to upgrade their programs and capabilities in science education and academic research." The objective of the largest and most important component of this program, University Science Development (USD), was to increase "the number of Ph.D. degree-granting institutions of recognized superior quality in research and science education, ... through the provision of substantial funds ... designed to produce significant up-grading in the quality of the institution's science activities". Few restrictions were placed on the purposes for which funds were requested; in total, 40 percent of USD funds supported personnel, 38 percent equipment, and 23 percent supported facilities.

SENATOR KERREY: b) How does NSF evaluate it?

ANSWER: At the conclusion of the program, NSF asked the National Research Council to conduct a comprehensive evaluation of the program. The results of this evaluation are published in Science Development: An Evaluation Study, by Dr. David E. Drew, (Washington, D.C.: National Academy of Sciences, 1975, pp. 1-182). Briefly, the evaluation criteria were faculty size and publication rates, graduate student enrollment size, test scores and baccalaureate origins of graduate students, Ph.D. production, and characteristics of institutions at which Ph.D.'s took their first jobs.

While few federal programs are without some problems, on balance, the benefits of the Institutional Science Development program greatly outweighed the detriments. As Dr. Drew writes, "Science Development funds greatly accelerated the pace of development, allowing universities to reach a point in 1970 that they might not otherwise have attained until 1980." For example, at the University of Arizona, $7.2 million of Science Development funds bolstered several physical science departments, most notably astronomy. A major portion of the award was used to construct a 90-inch reflector telescope on neighboring Kitt Peak. As Dr. Drew notes in Strengthening Academic Science (New York: Praeger Publishers, 1985, p. 31), "The Arizona astronomy department was not considered for national ranking in Allen Carter's national evaluation in the mid-1960's; by ... 1970, it was ranked fifth in the country."

SENATOR KERREY: c) Why was it discontinued?

ANSWER: The Science Development program was terminated in 1971 as a result of an administration-wide cutback of funds for higher education. Further indication of this trend is seen in funding for the related Science and Engineering Education Activity, which fell from $135 million in 1968 to $62 million in 1973.

SENATOR KERREY: d) What would be the criteria for Bootstrap Awards - who would qualify?

ANSWER: NSF's former Institutional Science Development Program and Senator Kennedy's bill, the "Excellence in Science, Mathematics, and Engineering Act" (S. 2114) are not sufficiently analogous to permit a meaningful comparison. The primary focus of NSF's program was on building the research capacity of a targeted group of graduate degree-granting institutions. Title III of S. 2114, the most closely analogous portion, focuses on strengthening teaching in science, mathematics and engineering.

Further, we feel it premature to attempt to establish review criteria for awards envisioned in S. 2114, the nature and scope of which are subject to further debate and refinement during this session of Congress.

SENATOR KERREY: Does NSF currently have any program which is directly geared toward upgrading departments of colleges and universities as the Bootstrap program is designed to do?

ANSWER: The National Science Foundation's Division of Research Initiation and Improvement (RII) conducts programs that contribute to the future development of S&E by initiating and supporting research and educational activities that strengthen the national resource base for science and engineering. In addition, the Directorate for Computer and Information Science and Engineering (CISE) sponsors a series of programs designed to develop institutional infrastructure, and the Foundation operates the Experimental Program to Stimulate Competitive Research (EPSCoR).

The general objectives of RII programs are: to increase the competitiveness of participant scientists and engineers, working as individual investigators, research groups, or research centers to obtain research and development (R&D) funds; to effect long-term improvements in the quality of science and engineering (S&E) research and education programs; and to insure that improvements achieved through NSF-initiated activities continue beyond the end of the NSF grant period. Within this Division, the Foundation operates two major initiatives to enhance the R&D infrastructure at minority institutions. These include the Research Improvement in Minority Institutions (RIMI) and the Minority Research Centers of Excellence (MRCE). In FY 1991, $12.8 million is requested for these two initiatives; these efforts support departmental enhancement and research clusters and centers in 15 - 20 minority institutions each year and provide a strong environment for training minorities in science and engineering.

The CISE Institutional Infrastructure Programs are designed to support the establishment, enhancement and operation of major experimental facilities planned to support research activities in all CISE research areas. These awards generally range from 2 to 4 million over a five year period. A primary objective of the program is to stimulate experimental research as measured by increased scientific activity and increased participation of both faculty and graduate students. The basic program has been expanded to specifically target minority institutions and institutions that require "small scale" infrastructure support. These programs have been perceived as quite successful. The NSF's Program Evaluation Section has just begun a comprehensive evaluation of the program that should be completed by mid-1991.

Initiated in 1980, the goal of the EPSCoR initiative is to increase the science and engineering research capabilities of participating states to a nationally competitive level. The formulation of the specific strategies and mechanisms to achieve this goal is the responsibility of the participant State. Based upon their present stage of development, sixteen states and the Commonwealth of Puerto Rico are eligible to participate in the program. The States include Alabama, Arkansas, Idaho, Kentucky, Louisiana, Maine, Mississippi, Montana, Nevada, North Dakota, Oklahoma, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming. Since its inception in 1980, the NSF has awarded a total of $49.4 million to the States through research improvement grants ranging in size from $2.5 to $3.0 million over a five-year period. The participants have matched this amount with a total non-Federal contribution of $156.5 million for a total program expenditure of $205.9 million.

EPSCoR (EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH)

SENATOR KERREY: What was the criteria for inclusion as an EPSCoR State in 1980?

ANSWER: The primary qualifying criterion to compete to become an EPSCoR state in the original competition in 1980 was the history of state success in competition for NSF Scientific Research Project Support. NSF data were examined for fiscal years FY 1974, 1975, and 1976 and states receiving less than $1 million per year from NSF were selected for initial consideration. Eighteen states qualified.

Within this set of 18 states additional indicators of competitiveness were examined, including: doctoral scientists and engineers per 1,000 population; doctoral academic scientists and engineers per 1,000 population; total federal R&D dollars obtained in last three years; federal R&D dollars to the state's universities and colleges; and ratio of federal R&D dollars to universities and colleges to number of science faculty receiving federal R&D funds.

The eighteen qualifying states were then rank-ordered based on their cumulative performance on these indices with each index equally weighted. The 7 states, least competitive on the indices, were selected for participation in EPSCoR. Of these 7 state, five received EPSCoR support in the first competition in 1980.

SENATOR KERREY: What are the 16 EPSCoR States; how much has each received since 1980; which institutions received the funds?

ANSWER: Based upon their present stage of development, sixteen states and the Commonwealth of Puerto Rico are eligible to participate in the program. The States include: Alabama, Arkansas, Idaho, Kentucky, Louisiana, Maine, Mississippi, Montana, Nevada, North Dakota, Oklahoma, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming. Since its inception in 1980, the NSF has awarded a total of approximately $49.4 million to these states through research improvement grants ranging in size from $2.5 to $3.0 million over a five-year period. A breakdown of the funding distribution through fiscal year 1990 and the institutions receiving funds are shown below.

Alabama ($2,382,853) - Alabama A&M University, The University of Alabama (Birmingham, Huntsville, and Tuscaloosa), Auburn University, and The University of South Alabama

Arkansas ($3,310,000) - The University of Arkansas (Fayetteville, and Little Rock), University of Arkansas Medical Sciences Campus, Arkansas State University, and Hendrix College

Idaho ($1,188,000) - The University of Idaho

Kentucky ($2,714,896) - The University of Kentucky, Louisville University, Western Kentucky University Eastern Kentucky University, and Murray State University

Louisiana ($1,188,000) - Louisiana Marine Consortium, Louisiana State University, Tulane University, Louisiana Tech University, and The University of Southwestern Louisiana

Maine ($3,650,000) - The University of Maine and Bigelow Oceanographic Laboratory

Mississippi ($1,108,000) - The University of Mississippi (Oxford and Medical Center), Mississippi State University, Southern Mississippi University, and Jackson State University

Montana ($3,225,000) - Montana State University, The University Of Montana, and Montana College of Mineral Science and Technology

Nevada ($2,447,381) - The University of Nevada (Reno), The University of Nevada (Las Vegas), and The Dessert Research Institute

North Dakota ($2,608,828) - The University of North Dakota and North Dakota State University

Oklahoma ($2,830,000) - Oklahoma State University, The University of Oklahoma, and The University of Tulsa

Puerto Rico ($2,831,202) - The University of Puerto Rico (Mayaguez, Rio Piedras, Humacao University College, Center for Energy and Environmental Research), and Ponce School of Medicine, Catholic University of Puerto Rico

South Carolina ($2,90,000) - The University of South Carolina, Medical University of South Carolina, and Clemson University

South Dakota ($1,138,000) - The University of South Dakota, South Dakota State University, and South Dakota School of Mines and Technology

Vermont ($2,172,835) - The University of Vermont and Middlebury College

West Virginia ($2,900,000) - West Virginia University and Marshall University

Wyoming ($2,629,069) - The University of Wyoming

SENATOR KERREY: Five States (Arkansas, Maine, Montana, South Carolina, West Virginia) have been awarded a second round of grants. Is it NSF's plan to award all EPSCoR States a second grant?

ANSWER: The initial five EPSCoR States each received $2.5 - $3 million under the 5-year EPSCoR Implementation award during 1980-85. No additional NSF/EPSCoR support was provided to these states from 1985 to 1990. The FY 1989 Appropriation Act urged the Foundation to invite these states to re-compete for up to five additional years of EPSCoR support, commencing in FY 1990. The states have since received additional support for FY 1990-91 so that all of the 17 EPSCoR participants would be receiving NSF support in FY 1991 when a new Advanced Development competition would be initiated. At its February 1989 meeting the National Science Board received information on the EPSCoR Long Range Plan, including a proposed FY 1992 EPSCoR Advanced Development competition. Under this proposed plan, all of the current 17 EPSCoR participants [including the five here] would compete for approximately 10 Advanced Development awards. Each award would be for three-years at up to $1.5 million per year for a total program cost of $15 million in FY 1992.

SENATOR KERREY: What are the EPSCoR criteria today?

ANSWER: The number of states eligible for the EPSCoR program has not been expanded since 12 participants were added to the original five states for the 1985 competition. The EPSCoR selection criteria used to select the participants in 1985 were essentially the same as those used in 1978 and described in the response to the first question with the following exceptions: the qualifying limit on the amount of NSF funds received was raised from $1 million per year to $3 million per year and the amount of academic Federal R&D was used in place of the total Federal R&D amount in the ranking process.

SENATOR KERREY: If four more States were added to the EPSCoR program, what would this make the criteria? What would those States be?

ANSWER: Using the 1985 criteria with updated data no additional states would qualify. If, however, the qualifying limit was raised to $5 million per year or less from NSF, then four additional states would qualify: Kansas, Nebraska, New Mexico, and New Hampshire.

SENATOR KERREY: If nine more States were added (for a total of 25), what would those States be?

ANSWER: Using $5 million of NSF funds per year as an upper limit to EPSCoR eligibility, it is not possible to expand the number of states beyond the four additional states listed in the response to the previous question.

SENATOR KERREY: What is your request for EPSCoR in fiscal 1991? What was allotted to this program in FY 1989 and FY 1990? What was allocated to the program in 1980?

ANSWER: The FY 1991 budget request for EPSCoR is $9.8 million. This compares with a FY 1989 budget allocation of $8.0 million and a FY 1990 allocation of $9.8 million. In FY 1980, the EPSCoR budget was approximately $3 million and supported five states at $600,000 each per year.

SENATOR KERREY: In a news release on the second grants to five States, you indicate that the research activities were selected by the States and merit-reviewed by the Foundation. How many proposals were merit-reviewed and how was the merit review conducted?

ANSWER: In the second grant competition for the original five states (FY 1990) each state submitted one overall EPSCoR Research Improvement Plan plus component research proposals in areas selected for enhancement by the state. The separate EPSCoR proposal was reviewed by scientists, engineers, educational and research administrators, and personnel from the NSF disciplinary research divisions. A site visit was conducted for each of the five states by review teams consisting of from four to six persons. The reviewers examined the research infrastructure, the research personnel, and the institutional commitment to the project. Written reports were submitted by each site visitor that addressed the following issues: Project Management; Faculty/Student Quality and Development; Instrumentation and Facilities; State Commitment and Liaison; and Future Opportunities for Continuation and Growth.

The component research proposals were also reviewed by nationally competitive scientists and engineers who read the proposals and provided NSF with comments. From three to six reviews were obtained for each of the separate research component proposals. On the basis of these reviews and site visit reports, a number of research proposals were eliminated and the most promising were supported. A total of 25 research proposals were submitted by the 5 states. Listed below are the research proposals receiving NSF support.

ARKANSAS

Center for Protein Dynamics; R. Koeppe
  Arkansas Neurobiology Research Center; E. E. Garcia-Rill
Center for Cellular and Molecular Studies on Biological Aging; S. Goldstein

MAINE
Global Climate Change: Maine EPSCoR Marine Science Component; D.L. Taylor
Abrupt Global Climate Changes and Their Consequences to Maine; G.H. Denton

MONTANA
Determining and Mimicking Active Sites of Protein-Protein Interactions in Biological Control and Adhesion; E.A. Dratz
Complex Interactions in Large Oligotrophic Lakes: Non-Native Species as Strong Interactors Controlling Spatial and Trophic Linkages; J.A. Stanford
Cellular and Developmental Neurobiology and Neural Mechanisms of Behavior; J.A. McMillan
Research in Gravitation and Astrophysics; W.A. Hiscock
Gas Phase Ion Processes at Very High Pressures; E.P.Grimsrud

SOUTH CAROLINA
Molecular Genetics, Genome Mapping, and Gene Manipulation; A. G. Abbott
Program in Molecular and Population Biology; R. H. Sawyer

WEST VIRGINIA
Cell Regulatory Biology Group; G.L. Wright
Nonlinear Dynamics Research Group; K. Showalter

SENATOR KERREY: When you are merit-reviewing proposals under programs designed to strengthen or improve departments or colleges/universities which might not otherwise be competitive, what criteria/directions are given?

ANSWER: The review criteria used for the component research projects submitted by states for enhancement in the EPSCoR program are similar to those employed by the NSF disciplinary divisions. To receive EPSCoR funding the research must, at a minimum, show potential to be nationally competitive with the promise of achieving significant improvement as a consequence of the EPSCoR award. Each research proposal is judged according to the following criteria:

Research performance competence: The capability of the investigator(s), the technical soundness of the proposed approach, and the adequacy of the institutional resources available.

Intrinsic merit of the research: The likelihood that the research will lead to new discoveries or fundamental advances within its field of science and engineering, or have substantial impact on progress in that field or in other scientific and engineering fields.

Effect on the infrastructure of science and engineering: The potential of the proposed research to contribute to better understanding or improvement of the quality, distribution, or effectiveness of the Nation's scientific and engineering research, education, and human resources capabilities.

Utility or relevance of the research: The likelihood that the research can contribute to the achievement of a goal that is extrinsic or in addition to that of the research field itself and thereby serve as the basis for new or improved technology, or assist in the solution of societal problems.

The EPSCoR Implementation proposals, which provide infrastructure support to the proposed research activities, are judged in the following areas: Project Management; Faculty/Student Quality and Development; Instrumentation and Facilities; State Commitment and Liaison; and Future Opportunities for Continuation and Growth. The potential for success in achieving program and NSF goals is the primary criteria used in the review process.

SENATOR KERREY: Do these directions differ from those given for usual research activities?

ANSWER: The directions given to reviewers in the EPSCoR program differ in that less emphasis is placed on past performance relative to potential for future professional growth, since EPSCoR is a capability-building program. Major emphasis is placed upon the level of non-federal support of the EPSCoR improvement plan and the extent to which the EPSCoR proposal shows promise of stimulating positive changes in the research and training environment in the states.

CENTERS IN GENERAL

SENATOR KERREY: NSF has been pursuing a "Center" approach, despite some reservations expressed by the House regarding this.

(a) Please provide a list of the existing (i) Science and Technology Centers, (ii) Engineering Research Centers, (iii) Industry/University Co-operative Research Centers, and (iv) Comprehensive Regional Centers for Minorities. (If fiscal 1990 centers are not included, please indicate how many are to be funded in each category).

(b) How many centers are proposed to be added to each category in fiscal 1991.

ANSWER: The eleven Science and Technology Centers are:

- Center for Development of an Integrated Protein and Nucleic Acid Biotechnology -- California Institute of Technology;
- Center for Microbial Ecology -- Michigan State University;
- Center for Discrete Mathematics and Theoretical Computer Science -- Rutgers University;
- Center for Research on Parallel Computation -- Rice University;
- Center for Analysis and Prediction of Storms -- Univ. of Oklahoma;
- Center for Particle Astrophysics -- Univ. of California, Berkeley;
- Center for Photoinduced Charge Transfer -- Univ. of Rochester;
- Center for Superconductivity -- Univ. of Illinois, Urbana-Champaign;
- Center for High-Performance Polymeric Adhesives and Composites -- Virginia Polytechnic Institute and State University;
- Center for Quantized Electronic Structures -- Univ. of California, Santa Barbara; and
- Center for Advanced Cement-Based Materials -- Northwestern University.

The 19 Engineering Research Centers are:

- Advanced Combustion Technology -- Brigham Young University/University of Utah;
- Hazardous Substance Control -- Univ. of California, Los Angeles;
- Engineering Design -- Carnegie-Mellon University;
- Data Storage Systems -- Carnegie-Mellon University;

- Optical Computing Systems -- Univ. of Colorado, Boulder;
- Telecommunications Research -- Columbia University;
- Emerging Cardiovascular Technologies -- Duke University;
- Compound Semiconductor Microelectronics -- Univ. of Illinois, Urbana-Champaign;
- Advanced Technology for Large Structural Systems -- Lehigh University;
- Systems Research -- Univ. of Maryland/Harvard University;
- Biotechnology Process Engineering -- Massachusetts Institute of Technology;
- Interfacial Engineering -- Univ. of Minnesota;
- Geometrically-Complex Field Problems -- Mississippi State University;
- Interfacial Microbial Process Engineering -- Montana State University;
- Advanced Electronic Materials Processing -- North Carolina State University;
- Net Shape Manufacturing -- Ohio State University;
- Intelligent Manufacturing Systems -- Purdue University;
- Offshore Technology -- Texas A&M/Univ. of Texas at Austin;
- Plasma-Aided Manufacturing -- Univ. of Wisconsin/Univ. of Minnesota.

The 41 Industry/University Cooperative Research Centers are listed below. (The number of centers are in parenthesis when more than one is at an institution.)

- Alfred University (NY) -- Glass Research;
- Brown University -- Thin Film and Interface;
- Univ. of Arizona (2) -- Optical Circuitry, Microcontamination Control;
- Univ. of California, Berkeley -- Integrated Sensors;
- Univ. of California, San Diego -- Ultra High-Speed Circuits;
- Carnegie-Mellon University -- Steelmaking
- Case Western Reserve University -- Applied Polymer Research;
- Univ. of Colorado -- Microwave and Millimeter Wave Computer-Aided Design;
- Colorado School of Mines -- Steel Processing;
- Univ. of Florida/Purdue University -- Software Engineering;
- Georgia Institute of Technology (2) -- Materials Handling, Information Management;
- Univ. of Iowa -- Simulation of Mechanical Systems;
- Iowa State University -- Non-Destructive Evaluation;
- Lehigh University (2) -- Chemical Modelling and Control, Innovation and Research Management;
- Univ. of Maryland -- Life Cycle Engineering;

- Univ. of Massachusetts -- Polymers;
- New Jersey Institute of Technology -- Hazardous Waste Management;
- Univ. of New Mexico -- Micro-Engineered Ceramics;
- New Mexico Institute on Mining & Technology -- Energetic Materials;
- Univ. of North Carolina/Duke University -- Monoclonal Lymphocyte Technology;
- North Carolina State University (2) -- Telecommunications, Aseptic Processing;
- Northeastern University -- Electromagnetics
- Northwestern University -- Tribology
- Ohio State University -- Welding Research;
- Oklahoma State University -- Web Handling;
- Pennsylvania State University -- Dielectrics;
- Univ. of Pittsburgh -- Parallel and Distributive Intelligent Systems;
- Rensselaer Polytechnic Institute -- Interactive Computer Graphics;
- Rutgers University (2) -- Ceramics, Plastics;
- Univ. of Southern California -- Manufacturing Automation;
- SUNY at Buffalo -- Biological Surface Science;
- Univ. of Tennessee -- Measurement & Control Engineering;
- Univ. of Texas, Arlington -- Advanced Electronic Devices;
- Univ. of Texas, Health Science Center, San Antonio -- Cell Regulation;
- Univ. of Washington -- Process Analytical Chemistry; and
- Washington State University -- Analog/Digital Circuits.

Five or six new IUCRCs are planned to begin in FY 1990.

The 8 Comprehensive Regional Centers for Minorities are located in:

- Atlanta (Clark Atlanta University);
- New York City (CUNY City College);
- Puerto Rico (University of Puerto Rico);
- Los Angeles (California State University-Los Angeles);
- St.Louis (Univ. of Missouri-St. Louis);
- Philadelphia (PATHS/PRISM);
- Florida (Florida A&M University); and
- El Paso (Univ. of Texas at El Paso).

Three or four additional new Comprehensive Regional Centers for Minorities are planned to begin in FY 1990.

In addition to the above programs, the Foundation also supports 6 Minority Research Centers of Excellence (MRCE). The MRCE program is designed to develop the research and training programs at the most research productive minority institutions. The program provides support to those research groups in minority institutions that are at or close to the cutting edge of research in critical science and engineering areas. The MRCE program is the flagship of the NSF research and training enhancement programs for minority institutions and requires a significant research base. These centers are:

- Howard University, Washington D.C--Materials Science;
- Meharry Medical College, Tennessee--Cellular and Molecular Biology;
- Alabama A&M University--Nonlinear Optics and Optical Materials;
- City College of the City University of New York (CUNY)--Analysis of Structures and Interfaces;
- University of Texas at El Paso--Materials Science; and
- University of Puerto Rico--Tropical and Caribbean Research.

In FY 1991 the Foundation plans to fund 10-12 new Science and Technology Centers, 3-4 new Comprehensive Regional Centers for Minorities, 5-6 new Industry/University Cooperative Research Centers, and 2 new Minority Research Centers of Excellence. No new Engineering Research Centers are planned to begin in FY 1991.

SENATOR KERREY: What is the fiscal 1991 request for each category of centers? How much in each category is for existing centers and how much for new ones?

ANSWER: The following table presents the FY 1991 request for the four categories of centers and for the Minority Research Centers of Excellence.

(Millions of Dollars)

	FY 1991 Request		
	Existing Centers	New Centers	Total
Science & Technology Centers	$27.1	$25.0	$52.1
Engineering Research Centers	50.1	0.0	50.1
Comprehensive Regional Centers for Minorities	11.3	3.7	15.0
Industry/University Cooperative Research Centers	3.9	1.4	5.2
Minority Research Centers of Excellence	5.8	2.0	7.8

SCIENCE AND ENGINEERING EDUCATION

SENATOR KERREY: Because of the impending shortage of qualified scientists, mathematicians, and engineers, it is important to appeal to those who might be interested in these fields, wherever they might be. What steps are you taking to insure that your educational activities will be widespread?

ANSWER: NSF has two specific programs that attempt to recruit young people into science, mathematics, and engineering. The Career Access Program supports Comprehensive Regional Centers that identify, recruit and nurture youngsters from underrepresented groups by offering enrichment opportunities from pre-school through the baccalaureate degree. The Young Scholars Program concentrates on providing introductory research opportunities to talented students in grades 7-12.

On a broader scale, every NSF educational program takes meaningful steps to ensure that its activities are reaching a wide audience. To cite some specific examples:

- the newly-announced Statewide Systemic Initiative is an effort to affect the science and mathematics activities throughout every school district of a state, thereby reaching every pre-college student in that state.

- NSF Teacher Enhancement projects reach some 12,000 teachers each year (covering, on average, 45 of the 50 states each year). Approximately one-fifth of those teachers are trained to be leader teachers who can, in turn, provide in-service opportunities for their colleagues.

- All pre-college programs are required to include in their project a plan for dissemination. In particular, the Material Development projects involving publishers offer the expectation of widespread dissemination.

- NSF makes every effort to distribute widely publications that describe the Foundation's programs, the opportunities for participation by all facets of the educational community, and information about the projects being supported.

SENATOR KERREY: You have proposed a new statewide systemic initiative. a) How many programs do you expect to fund under this initiative?

ANSWER: Current plans are to support four to eight programs the first year (FY 1991).

SENATOR KERREY: b) What efforts will be made to appeal to a wide range of states?

ANSWER: The guidelines for this project have been established to attract the attention of any state interested in affecting meaningful systemic reform in the teaching of science and mathematics. NSF is working with the National Governors' Association to ensure a wide, yet targeted distribution to each of the states.

SENATOR KERREY: c) How much is requested for this effort?

ANSWER: NSF has requested $12 million in FY 1991.

SENATOR KERREY: NSF apparently considered a similar program for the 100 largest school districts in the U.S. What happened to that proposal?

ANSWER: A program focussed on improving the effectiveness of science and mathematics teaching in schools with high minority populations was initiated in FY 1989 and forms the basis for continuing discussions to develop, in the future, an "urban initiative" analogous to the "statewide systemic initiative" which is being started in FY 1991.

SENATOR KERREY: At the elementary and secondary level, your focus seems to be on teacher preparation and curriculum development. Are there other initiatives the Foundation can or should pursue at this level?

ANSWER: If one includes both pre-service and in-service teacher training in the term "teacher preparation", then it is certainly true that the NSF pre-college programs focus upon the two areas mentioned. We strongly believe that we can leverage our resources most effectively in those areas. Our educational dilemma in science and mathematics will not be totally solved by a one-time fix; it is a continuing and evolving problem. Since teachers and curriculum are the two most stable elements of the educational equation, improvements in the quality of those two areas offer the best long-term solution to the educational crisis.

This emphasis does not mean, however, that the NSF ignores other areas. It is essential that we try innovative methods, as well as continue other efforts such as attracting students into science and mathematics, involving the private sector in education, providing informal science education activities, finding improved uses for computers in the classroom, and learning more about the teaching/learning process itself.

Recently, we unveiled a large-scale, innovative program to stimulate states to undertake comprehensive, integrated improvements in their systems of teaching and learning of mathematics and science. Statewide Systemic Initiatives will assist states in their efforts to address the systemic nature of problems facing science, mathematics and engineering education.

Just as our educational dilemma in science and mathematics will not be solved by one program, it will not be solved by one agency. All of us -- federal and state governments, school systems, teachers, parents and students -- need to work together if we are going to achieve our goal of making U.S. students first in the world by the turn of the century.

SENATOR KERREY: Do we know, based upon research, what is most likely to stimulate interest in science and math of elementary students?

ANSWER: Our understanding of children's interest in science and math is grounded primarily in developmental psychology (e.g. Piaget, Bruner) as well as in the literature in science and math education. Many investigators have called for research to help improve our methods of studying student attitudes in science and math. (e.g. National Research Council, 1988)

The following are some of the key ideas:

- Young children are naturally curious and interested in the world around them. They are natural investigators and ask an unending stream of questions. Children are interested in, and react to, all aspects of their environment.

- Children must be allowed to experience firsthand as many objects and events as possible so that they can develop their own creative powers of investigation.

- Children must be able to share their experiences with others, to consider other viewpoints, and to evaluate these social interactions thoughtfully.

- Children need to explore the physical properties of objects.

- Children like to plan and carry out their plans.

- Open-ended investigations are more interesting than "experiments" for which the "answers" are given.

- Children are more interested in activities that build on their prior experiences and ideas than ones that are unrelated to their own concrete experience.

- Children are interested in real problems, which they help to define.

- Children are interested in projects where they gather and analyze the data and share their findings with others.

- There is very little if any relationship between general ability measures such as IQ and student attitudes towards science. There is no relationship between socioeconomic status and attitudes towards science.

BIG PROJECTS VS. SMALLER ONES

SENATOR KERREY: Can you provide a list of the $100+ million research projects currently underway or planned in each of the departments and agencies of the federal government?

ANSWER: We are aware of large research programs being supported by other agencies, such as the DoE-supported Supercolliding Superconductor, the NIH-supported Human Genome project, efforts in AIDS research, and the various NASA-supported missions. However, it is not within the Foundation's purview to track these projects, nor do we compile any lists of such projects.

NSF's contribution to the Global Change Research Program is expected to total $103 million in FY 1991. Other research programs supported by the Foundation, such as the National Earthquake Hazard Reduction Program and the Long Term Ecological Research Sites, are substantially smaller but will exceed $100 million in total over four to six years.

NSF facilities projects which include a research component and are expected to total more than $100 million include:

- Very Long Baseline Array (VLBA);
- Laser Interferometer Gravitational Wave Observatory (LIGO);
- National High Magnetic Field Laboratory; and
- Two 8-Meter Optical/Infrared Telescopes.

SENATOR KERREY: There appears to be a trend toward large-scale projects - SSC, HDTV, your own gravitational wave project, Maglev transportation, etc.

(a) Do you see this as an inevitable trend?

ANSWER: In some fields, yes. As finer-scale resolution is required by science, i.e. looking deeper into space (telescopes) or probing the units of the atom (accelerators), more unique, sophisticated and costly equipment will be required.

Scale is a relative matter. The gravity wave detector (total estimated cost $190 million) is but 3.3 percent of the currently estimated $6.0 billion cost of the Supercolliding Superconductor (SSC).

NSF will always maintain a balanced portfolio of programs that will support not only the individual investigator mode of small-scale research, but also the facilities and equipment necessary for certain disciplines to carry out their research.

(b) What does it portend for smaller projects and smaller institutions?

ANSWER: NSF has a particular responsibility to see to the fitness and well-being of the nations research infrastructure. With that comes an acute awareness, and responsibility, for small-scale research, for a balance of the ways research is conducted, for geographic distribution, and for broadening participation. NSF will continue to advocate a balanced approach to supporting the nation's basic research enterprise. And, historically at NSF, over 70 percent of the research funds support small-scale (e.g. individual investigators, groups, and other research resources) research.

SENATOR KERREY: When you have a project which does not work out as planned, such as the supercomputing facility at Princeton, what is your financial loss?

ANSWER: The John von Neumann Center (JvNC) at Princeton was not renewed after its five year cooperative agreement expired on April 30, 1990. There was minimal financial loss to NSF due to closing the center. The building to house the center was paid for by the state of New Jersey. Very little was paid for the computers themselves because ETA was consistently behind in meeting the contract specifications with JvNC. The cost for outfitting the building shell into a computer facility was approximately $5 million and could be considered a loss.

SENATOR KERREY: What are the redeeming aspects to a situation like this?

ANSWER: Much valuable research was accomplished on the Cyber 205s and ETA-10s during the five years that the center was operational. Although the machines were often difficult to use because of the software and hardware problems associated with the computers, those researchers whose programs could be made to run, achieved many useful results.

During FY 89, the JvNC provided 27,000 service units (one service unit is roughly equivalent to one Cray XMP hour) to over 5400 users participating in over 300 active awards for time on its two types of equipment, an ETA10, and two Cyber 205s. Over its five year lifetime the total number of units provided to users was in excess of 69,000. (The computers at the remaining four centers have been upgraded to more than replace the cycles lost by closing the John von Neumann Center).

The scientific studies performed on the JvNC supercomputers were similar in breadth to that at the other four Supercomputer Centers, with possibly more concentration on the topic of turbulence and fluid flow. Some examples of studies completed include:

- Materials science (Univ. of Rochester): Computation of the properties of newly created nanomaterials.

- Physical Oceanography (Columbia Univ.): Calculation of variability of "The El Nino" Southern Oscillation phenomenon, one of the most significant modes of yearly climate variability.

- Biochemistry (Harvard Univ.): Investigation of the role that internal molecular motions play in biomolecules.

- Astrophysics (Univ. of Colorado): Thermal convection at the surface of stars.

One of the primary purposes of the initial focus of the NSF Supercomputer Program was to foster U.S. competitiveness in supercomputer technology. Clearly, setting up a center with an ETA machine was a risk worth taking. If the machine had functioned as promised, as early as promised, then this would have been a definite plus for the U.S. supercomputing industry.

SENATOR KERREY: Was the Princeton loss the largest recent NSF loss? If not, what were the other major ones?

ANSWER: The closing of JvNC was the most notable and probably the most recent "loss" to NSF'sportfolio of scientific support activities. However, NSF has earned a reputation as one of the most efficient and effective scientific funding agencies by routinely monitoring and, if necessary, "closing down" research activities that are no longer productive or cutting edge, including telescopes, centers such as Materials Research Laboratories and Engineering Research Centers, and individual investigator projects which are no longer on the cutting-edge of science.

Some specific examples include:
  The Materials Research Laboratories at:
    Ohio State University
    Brown University
    Purdue University
    Carnegie Mellon University
    Case Western Reserve University

  The Engineering Research Centers at:
    University of Delaware
    University of California - Santa Barbara
    University of California - Los Angeles

  The Aladdin project at the University of Wisconsin - Synchrotron Radiation Center

ASSISTANCE TO UNIVERSITIES AND COLLEGES RECEIVING THE LARGEST AMOUNTS

SENATOR KERREY: NSF does an annual report each year on federal support to universities and colleges.

(a). In each of the past ten years, what percentage of the total federal R&D budget went to the 100 universities and colleges receiving the largest amounts?

ANSWER: During the last ten years 85 percent of total Federal obligations for R&D at colleges and universities has gone to the 100 universities and colleges receiving the largest amounts; this has remained fairly constant.

SENATOR KERREY: (b) In each of the past 10 years, what percent of NSF's Research and Related Activities went to these 100 universities and colleges?

ANSWER: In the last ten years, the composition of the "top 100" universities has varied to a small degree for a number of reasons, with one of the primary reasons being that most grants are multi-year grants. A year-by-year analysis of the available data would require more time than is available for a reply. We have chosen, therefore, to focus on data from 1980 and

1988 as the two end points from which the information may provide some insight.

In 1980, these top 100 universities and colleges received $567.98 million, or 63.6 percent, of the NSF's R&RA obligations.

In 1988, these top 100 universities and colleges received $883.21 million, or 60.6 percent, of the NSF's R&RA obligations.

SENATOR KERREY: (c) In each of the past 10 years, what percent of NSF's Science and Engineering Education funds went to these 100 universities and colleges?

ANSWER: Again, due to time constraints, we have chosen to focus on 1980 and 1988 as the two end points from which the information may provide some insight.

In 1980, these top 100 universities and colleges received $26.64 million, or 34.5 percent, of the NSF's SEE obligations.

In 1988, these top 100 universities and colleges received $55.82 million, or 40 percent, of the NSF's SEE obligations.

SENATOR KERREY: How can colleges and universities which currently receive little or no research assistance from NSF upgrade their science and engineering research capabilities?

ANSWER: The National Science Foundation conducts several programs that are designed to assist colleges and universities that receive little or no assistance from the Foundation. An important NSF program is the EPSCoR program for states with less-developed R&D capabilities. Based upon their present stage of development, sixteen states and the Commonwealth of Puerto Rico are eligible to participate in the program. The States include Alabama, Arkansas, Idaho, Kentucky, Louisiana, Maine, Mississippi, Montana, Nevada, North Dakota, Oklahoma, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming. Since its inception in 1980, the NSF has awarded a total of approximately $49.4 million to the states through research improvement grants ranging in size from $2.5 to $3.0 million over a five-year period. The monies are used to improve the research capabilities of scientists and engineers at universities and colleges within the states.

The Foundation also conducts programs to strengthen research by faculty at predominantly undergraduate institutions. In FY 1989 the Foundation made research grants totalling $68.8 million to researchers at predominantly undergraduate institutions. Another $38.2 million went to these institutions from the Science and Engineering Education Activity. Programs include Research at Undergraduate Institutions (RUI) and the College Science Instrumentation Program (CSIP), a part of the generic Instrumentation and Laboratory Improvement (ILI) program.

Other NSF programs are actively reaching out to these kinds of institutions. For example, these institutions are being linked into the national network (NSFNet) through NSF's Networking and Communications Research Infrastructure Subactivity; super computer time is being made available; and other programs are actively seeking integration and coordination of activities such as linkages between center and consortia and small colleges.

SENATOR KERREY: Would NSF consider any type of outreach or technical assistance type programs to assist both public universities which have been unsuccessful in obtaining NSF funds and smaller, private institutions which have little or no experience in this area?

ANSWER: Upon request the staff of the National Science Foundation provides assistance to faculty at universities and colleges by explaining Foundation programs and procedures. In addition, since 1982 the Foundation has conducted a formal program of outreach activities to assist faculty at smaller and private institutions that have little experience in the preparation and submission of research proposals. These activities include: formal presentations by NSF staff at meetings of professional societies, committees, and associations; on-campus visits and regional workshops; and the distribution of special visuals and printed materials describing NSF programs and procedures.

All NSF staff are encouraged to participate in outreach activities when their schedule permits. Most staff satisfy this requirement through extension of travel carried out in connection with other Foundation business. In FY 1989 NSF staff participated in 61 on-campus workshops and 22 regional meetings for 2,427 faculty from 436 schools in 24 states. The Outreach program is extremely popular with faculty from predominantly undergraduate institutions and for many provides the necessary informational link that they have with the Foundation.

SENATOR KERREY: In my opening statement, I indicated that I thought NSF had probably served well established institutions well, but that I thought your support had been lacking for the less established institutions.

First, a philosophical question -- what do you see as the proper role for NSF? Do you see NSF as the federal entity which supports the well-known, the proven, the cutting edge of research or do you believe you have a broader responsibility to the research and educational community as a whole?

ANSWER: The National Science Foundation Organizational Act includes the provision that "...it shall be an objective of the Foundation to strengthen research and education in the sciences and engineering, including independent research by individuals, throughout the United States, and to avoid undue concentration of such research and education." While it is true that the NSF review procedure emphasizes scientific merit, one of our standard review criteria specifically places emphasis on a project's potential for improving our scientific and engineering infrastructure. It is this criterion that specifically enables us to redress potential inequities in the geographic distribution of our funding.

The Foundation is very sensitive to providing broad support for science and engineering throughout the United States. The research centers program (both Engineering Research Centers and Science and Technology Centers) have widespread geographic distribution. In addition, the Foundation has a model program that is designed to build the science and engineering infrastructures in States that have traditionally been unsuccessful in competing for Federal R&D support. The Experimental Program to Stimulate Competitive Research (EPSCoR) has been successful in helping sixteen States and Puerto Rico build more competitive individuals and programs. EPSCoR will be continued for another 4-6 years with emphasis on State commitment and State initiatives. We have high hopes for success under this program.

SENATOR KERREY: Second, in looking back over the past 5 or 10 years, there have been some modest efforts--or demonstration efforts--or something of that sort--to broaden your support. I will mention EPSCoR and Centers of Excellence which I understand is the model for the Bootstrap awards in S 2114, the Kennedy bill, to illustrate what I am thinking about. Of these efforts, which would you mention as the most important and innovative in broadening your base of support?

ANSWER: The National Science Foundation's Division of Research Initiation and Improvement (RII) conducts programs that contribute to the future development of S&E by initiating and supporting research activities that strengthen the national resource base for science and engineering. These include many important programs that are designed to improve the participation of women, minorities, and the disabled in science and engineering research and education. Certainly these efforts are of prime concern to the Foundation and the well-being of the nation's future research and education base. However, from the point of view of innovation in program design, the Experimental Program to Stimulate Competitive Research (EPSCoR) stands out.

The EPSCoR initiative began in 1979 as a federal response to the political concern that the S&E research capability of almost one-third of the nation was underdeveloped to the point that the academic institutions and their faculty in these states were essentially uncompetitive for federal R&D funding. Its basic premise was and remains that academic S&E research activity underpins a state's R&D competitiveness. Therefore, its goal is to bring the science and engineering research endeavors at academic institutions within participant states to nationally competitive levels.

One of the unique aspects of EPSCoR is the Foundation's proactive relationship with the state leadership and the development of a long-term partnership with the state. Within the EPSCoR partnership the NSF role is catalytic in nature and is designed to stimulate local action that will result in permanent improvements to the S&E research infrastructure. The formulation of the specific strategies and mechanisms to increase S&E research competitiveness remain the responsibility of the participant state. EPSCoR is, however, a National Science Foundation initiative and a competitive grant program not an entitlement. Any research improvement activities selected by the state must undergo merit review to insure national standards of quality and must demonstrate the potential for significant improvement or they are not supported.

SENATOR KERREY: I regret that Mary Good is not here today. She had a very interesting interview in an NSF publication not too long ago. I want to ask Mr. Bloch about several of her comments -- and I would ask the chair if we could make this exchange available to Dr. Good so that she could make any written response she might care to for the record.

(a) In this interview Dr. Good was asked what she thought of the merit review process and this was her reply: "I think you'll see some changes. Peer review works very well if I can fund one out of two, or better, of the good proposals I get. But, if I'm funding one out of ten, then I don't know what peer review tells me anymore. Since at least the top four are probably of indistinguishable quality, some criteria other than quality must come in. Then you'll begin to see prioritization and decisions based on what area of science you think ought to be funded."

Do you agree with Dr. Good's comments?

What kind of judgements are we getting when there are proposals of "indistinguishable quality" and what guidelines are there for determining priorities in those instances?

ANSWER: I agree with Dr. Good that once reviewers have helped sort out the top quality proposals from the others, and there are many more top quality proposals than can be funded; peer review by itself cannot provide sufficient information to make selections. However, the comments and ratings of reviewers provide valuable -- indeed, critical -- information, and I cannot see how we could do a good job without them.

NSF's system has become increasingly competitive. From FY 1980 to FY 1989 the number of proposal decisions increased 65.8%, to 27,438, and the number of awards by 27.6%, to 8,441. Thus, even with increases in appropriations, the overall "success rate" has fallen from 40% to a little more than 30% in ten years.

The views of reviewers are not controlling; they are advisory. We rely heavily on the expertise and judgement of more than 300 program officers to construct the best "portfolio" of awards for their programs, taking into account, among other things, the needs of the research infrastructure. It is precisely in these circumstances that our program officers are called upon to make their most difficult decisions, and we do have effective policies and criteria in place to guide.

SENATOR KERREY: (b) If we are interested in broadening our scientific base - in upgrading departments in some of the less well-established institutions, of helping those institutions which have not been very successful with NSF to do better, of bringing more women and minorities into the programs -- how does peer review work? Is it capable of setting priorities and pursuing these goals?

ANSWER: Through National Science Board policy guidance, creation of specialized programs, and internal management directives and controls we have made clear to program officers that where proposals are of essentially equal quality they should select those that would build National research capacity and infrastructure. This is done in various ways -- for example, by giving a break to proposals from first-time female and minority researchers or those from undergraduate departments, or by having a separate competition for engineering and computer science faculty that are applying for their first NSF grant.

Thus for the last several years we have taken measures to broaden the scientific base without compromising quality. Recent evaluations of two such measures show that the Foundation is capable of pursuing this goal effectively. Our Program Evaluation Staff has recently published assessments of the Research Opportunities for Women program and of our special effort to stimulate research at Primarily Undergraduate Institutions (PUIs). These efforts encouraged many more women and PUI researchers to apply to NSF, and helped them achieve award rates similar to those of more experienced investigators and from leading research institutions (NSF reports 90-13 and 90-36).

The principal reason why departments at less established institutions do not have more NSF funding is that their faculty members submit relatively few proposals to NSF. The most successful strategy for obtaining grants is to submit many proposals -- even a middling success rate brings resources to build upon, and declined proposers find the process of preparing a proposal and receiving reviewers' comments a valuable learning experience that raises the level of their understanding about the research topic and about the grantmaking system, and enables them to resubmit a revised proposal to NSF or submit it elsewhere.

Frequently, however, talented researchers are reluctant to write proposals because of an assumption that their institutional affiliation, geographic location, gender or race will unfairly "stack the cards" against them. Statistical studies and oversight reviews show no systematic evidence of such biases reflected in the decisions. Moreover, outside visiting committees that examine each program in detail every three years consistently report that program officers were careful and balanced in their judgements.

QUESTIONS SUBMITTED BY SENATOR GARN

FEDERAL BUDGET PROCESS

SENATOR GARN: Most assessments of what is happening in the Budget Committees of the House and Senate indicate that we will be lucky to sustain half of the increase proposed by the President for budget function 250, Science, Space, and Technology. After a budget resolution is adopted the Appropriations committees allocate budget resources among the subcommittees, and if recent history is a guide, we will lose even more of what was assumed in the resolution for programs under our jurisdiction. Please identify those portions of your budget request which you feel are of highest priority, and those which you feel can be deferred if we are unable to appropriate the full President's request for NSF.

ANSWER: Our priorities remain intact: people, instruments and facilities, in that order. Our top priority is bolstering education and human resources activities in order to secure a technologically literate workforce. After this, we need to focus more resources on the instruments and facilities necessary to accomplish effective research and teaching as well as accommodate more of the excellent research proposals that we currently can not support. And, it is important to maintain a balanced set of activities in order for the entire science and engineering research and education enterprise to move ahead in a orderly fashion. NSF faces major hurdles as major equipment and instruments built in the late 1950's and 1960's become obsolete as new research opportunities demand advanced or state-of-the-art facilities.

DoD RESEARCH FUNDING

SENATOR GARN: On page 10 of your statement you note the contribution of Defense support of science and engineering. Although it isn't talked about much, frankly wars have been a remarkable technology driver in history, and in many of the technologies you identify in your statement, the Department of Defense has played a significant role in the past decade. Concerns as advanced materials and composites, superconductors, computers, manufacturing technology are all areas where the DoD invests significant sums.

With the dramatic reductions being proposed for the Department of Defense budget, it appears almost a foregone conclusion that Defense science and engineering will be sharply curtailed. Do you feel that there should be increases in civilian research and development to offset such reductions in the Defense budget?

ANSWER: The President's FY 1991 Budget reflects a shift in favor of nondefense R&D, investing 60 percent of the government's total R&D effort into defense, compared to 65 percent in FY 1989. In fact, of the $4.4 billion increase requested for the conduct of R&D, nondefense R&D would receive 67 percent.

SENATOR GARN: What discussions have you underway to coordinate DoD program shifts in basic science and engineering with activities funded in your budget?

ANSWER: None. NSF's total budget is approximately 5 percent of the DoD R&D budget, a factor which severely limits our ability to significantly absorb an area of research which the DoD has determined to be nonessential. Secondly, Defense R&D is projected to increase $1.5 billion, from $41.0 billion in FY 1990 to $42.5 billion in FY 1991. Although in constant dollars this represents a decrease of about one-half of one percent, it does not, in our view, constitute an alarming policy shift away from funding essential R&D.

DoD is not a major contributor to basic research. In 1989, DoD support for basic research was $947 million, or 9.2% of the total funds obligated; $538 million went to universities and colleges, $278 million went to Federal intramural and the remainder went to other areas.

BIG VS. SMALL SCIENCE

SENATOR GARN: With the large increase proposed in the President's budget for science and engineering activities being contrasted with reductions in other areas, many here in Congress have focused on large science projects such as the Superconducting Super Collider, the Space Station "Freedom", and the Human Genome project as being too big and too expensive. Within your budget, we hear concerns over the failure to augment individual investigator research funding levels, although overall NSF funding has increased. Questions about the relative priority of large "centers" and instruments have been raised. In your budget request, you are proposing three major equipment initiatives, including construction of "gravitational wave" detectors at a total estimated cost of $192 million.

What is this, and do you feel this project is warranted if we are forced to make significant reductions in your budget request?

ANSWER: The Laser Interferometer Gravitational-Wave Observatory (LIGO) is a joint project of the California Institute of Technology and the Massachusetts Institute of Technology. The objectives of the research program associated with this instrument are tests of Einstein's General Theory of Relativity through the unambiguous discovery of gravitational waves and the opening of a new observational window onto the universe. The LIGO will consist of two detectors, widely separated within the continental United States, each having an L-shaped configuration with arms about 4 kilometers in length.

This research is stimulating technology development with potential industrial, defense, and space applications including:

- high precision metrology (the science of measurement);
- highly efficient lasers;
- high power lasers, mirrors, optical components and coatings;
- highly stabilized lasers (useful for research and communication);
- vibration isolation systems (useful for semiconductor chip making and processing, precision machine tools, electron microscopy);
- sensor development.

The Foundation's highest priority continues to be education and human resources. But for several years we have deferred needed investments in facilities, and we cannot continue to do so. The major equipment initiatives, including LIGO, are not only crucial to maintain our science and engineering preeminence in the world, but will also attract bright, enthusiastic young people to the world of science.

With a lower than requested budget, difficult choices will be required, both between and within disciplines. Overall, the priority for projects for which funding has already started will be maintained. However, LIGO is a very high priority item. Extensive technical planning has already been done, and the need for the facility has been demonstrated. Therefore, it is important to begin funding for LIGO in FY 1991.

GLOBAL CLIMATE CHANGE

SENATOR GARN: Earlier this year the Subcommittee had Dr. Bromley testify on the President's Global climate Change research program. The two largest agency programs in the F.Y. 1991 budget are proposed for NASA and the National Science Foundation. We will hear from NASA late next month, and I would like to ask of both your agencies not only about the activities which are proposed but also what particular role is envisioned for each in this long-term program.

What is NSF's role in this multiagency program?

ANSWER: NSF is responsible for maintaining the health of basic research in all areas of earth, atmospheric (including solar-terrestrial), and ocean sciences, including the relevant biological and social sciences and research in the polar regions. The basic research program is focused on ground-based studies on regional and global scales; large-scale field programs; interpretation and use of remotely sensed data and geographic information systems; theoretical and laboratory research; research facilities support; and the development of the numerical models, information and communication systems, and data bases.

SENATOR GARN: What has been accomplished in the past year with the funding provided?

ANSWER: The Division of Ocean Sciences has supported field programs, development of ocean circulation models, and the planning of new research programs. The Joint Global Ocean Flux Study successfully completed a five-nation, six-ship study of the 1989 spring phytoplankton bloom in the North Atlantic - a critical event in the transfer of carbon to the deep ocean. It involved over 400 ship-days and 105 scientists. The Tropical Ocean/Global Atmosphere (TOGA) Program maintained 200 drifting buoys to measure surface circulation of the equatorial Pacific in cooperation with other nations to aid development of accurate global climate models. The World Ocean Circulation Experiment (WOCE) completed a 15-year simulation of a North Atlantic general circulation model, as a pilot study for a global model. The emerging Ridge InterDisciplinary Global Experiments (RIDGE) published an initial science plan, initiated theoretical studies on ridge processes and continued a major seismic study of the structure of the East Pacific rise.

Research supported by the Division of Atmospheric Sciences has shown that the climate of Tibet was warmer during the last 50 years than at any time since the last ice age. The results are based on the changes in chemistry of glacial ice from an ice core in north-central Tibet. These results are in agreement with historical records from around the world and with other ice core records from Greenland, Antarctica and the Peruvian Andes. Other research has shown that changes in the Amazon rain forest may produce irreversible changes in climate that may inhibit natural reforestation. GCM simulations of the earth with and without the Amazon rain forest indicate that the rain forest contributes significantly to the moisture balance in the atmosphere in tropical regions. Without a rain forest, the Amazon region becomes so dry that it may be impossible for the rain forest to regenerate after it has been reduced in areal extent.

NSF contributed to a multi-agency-funded expedition to investigate Arctic ozone depletion during January and February, 1989 involving aircraft and ground-based experiments and over 100 scientists and support personnel. During the Austral Spring of 1989, NSF funded investigations of the ozone and aerosol abundances over the Antarctic utilizing balloon-borne instrumentation. The results of these measurement campaigns have increased our understanding of the processes responsible for the destruction of ozone in polar regions. The Division of Polar Programs has continued to support research on the depletion of ozone over Antarctica, measurements of UV flux resulting from ozone depletion, and evaluation of biological consequences of enhanced UV flux. Last year, researchers continued to expand understanding of ozone depletion from their initial discoveries, to elucidate greater details on mechanisms and rates. The ultraviolet measuring system in Antarctica and Tierra del Fuego continues to monitor UV-wavelengths known to be harmful to biological systems. Continued development of this novel analytical equipment has improved reliability and quality assurance for the program. Studies are expanding from effects on molecular and cellular levels to the consequences of increased UV on marine ecosystems in the Southern Ocean. A competition for a Long-Term Ecological Research (LTER) program in Antarctica was held. That program will begin with FY 1990 funds to study and develop long-term data sets on ecosystems along the Antarctic Peninsula.

By far the best record of climate and chemical constituents of the atmosphere over the last 150,000 years is obtained from ice cores. NSF is undertaking deep ice coring in central Greenland in cooperation with several European countries. During the summer of 1989 on-site preparations took place. These included the successful testing of a new drill and acquisition of 800 meters of ice to a depth of 225 meters to estimate the recent climate record at the site. NSF has encouraged further development of Arctic Systems Sciences through funding of workshops to evaluate the impact of global change on the Arctic and to understand how processes in the Arctic amplify global change.

Discussions began in 1987 to involve social and economic scientists more fully in analyses of the complex interactions among human and natural systems that influenced global environmental change. During FY 1988, a number of conferences and workshops aimed at identifying the status of knowledge about this topic and developing coordinated research agendas. In FY 1989, a special competition was established by the Division of Social and Economic Science on social research on global environmental change. Six proposals were funded covering topics such as: Social Learning in the Management of Global Environmental Risks, Human Dimensions of Global Environmental Change, and Critical Zones in Global Environmental Change.

QUESTIONS SUBMITTED BY SENATOR D'AMATO

UNDER-REPRESENTED GROUPS

SENATOR D'AMATO: Mr. Bloch, your testimony cites the need to expand our efforts to bring women and minorities into the science and engineering pipeline. Of the $463 million you are requesting for education and human resources development, how much is targeted specifically at women and minorities.

ANSWER: Of the $463 million, $85 million is targeted specifically on programs for women and minorities. These include programs to develop the pipeline for S&E career and efforts to enhance the capability of minority institutions across the nation.

SENATOR D'AMATO: Could you describe briefly the two new programs to assist underrepresented groups that you plan to establish in 1991? How many persons do you expect to serve annually in the second such program, the Alliances for Minority Participation?

ANSWER: Two major programs for women and minorities are proposed in FY1991: The Alliances for Minority Participation (AMP) and the Faculty Awards for Women Scientists and Engineers (FAW).

The AMP program will support the establishment of coalitions to significantly increase the number of underrepresented minorities that obtain B.S. degrees in science and engineering, enter graduate school, and successfully complete the PhD. The primary focus of this program is at the undergraduate level with linkages down to precollege and up to graduate school. Approximately 10 AMP projects will be initiated in FY 1991. It is expected that each project will contain significant investments from state and local government and the private sector. We do not, at present, know the number of students that will be personally affected in the AMP program.

The FAW program will, at the $5 million request, recognize 100 outstanding women scientists and engineers across the nation, and assist these women to enhance their research productivity and help move them into senior ranks in academia.

QUESTIONS SUBMITTED BY SENATOR GRASSLEY

SENATOR GRASSLEY: I am interested to know how the program evaluation produced by James McCulough's staff are utilized ...are changes actually being made in light of their findings ... in particular, I understand they have completed an evaluation of N-S-F's peer review process.

ANSWER: The Program Evaluation Staff (PES) is responsible for assessing the outputs of NSF programs and the workings of the proposal review system. PES is a small unit within the Office of Budget and Control, where their work feeds into program planning, budgeting, and monitoring. It specializes in long-term studies that require sophisticated statistical and survey work, serves as a "think tank" and general resource for management on internal issues, and assists our operating units in setting up their own data collection and evaluation activities. Recent studies include assessments of the Research Opportunities for Women, Presidential Young Investigators and Research Experiences for Undergraduates programs and the first overview of how the NSF system is treating proposals from Primarily Undergraduate Institutions.

PES reports are usually published by the Foundation and distributed widely to the academic research community, the science media, the OMB and the Congress. My staff and I are briefed about each report before its publication, and we have found them to be interesting and thought-provoking. The Evaluation Staff's work is considered independent, objective and professional by people within and outside the Foundation.

One of the first projects that Mr. McCullough proposed when I asked him to take over and revitalize the group four years ago was a survey of research applicants, to give us an overall picture of the applicant population and to seek their views of NSF's system. So in late 1986 he surveyed all 14,200 individual investigators at academic institutions whose research proposals were awarded or declined during fiscal year 1985. The report (number 88-4) contains a great many findings of interest to applicants, administrators and observers of the review process --so much so that the initial printing of 10,000 copies was not sufficient, and we have just reprinted it.

At first, the report's influence was indirect, that is, it helped illuminate for us the behavior and thinking of the various individuals and communities that interact with NSF, and how we interact with them. Later as we worked on various issues its findings fed into our deliberations. For example, the decision to authorize program officers to make small grants for exploratory research without external review was based in part on the finding that two-thirds of the respondents thought that the chance of getting favorable reviews for high-risk ideas was slim. The report was also very useful when we recently considered and adopted changes to the review process to improve feedback to declined proposers and provide them with a more open opportunity for reconsideration.

SENATOR GRASSLEY: My final question deals with an old subject: the Kalb case. I have followed the submission of a petition based on this case by "Public Citizen" and have recently received a copy of the NSF response.

I'd first like to say that I found the response to be very thorough and I was pleased to see that the concerns raised were being given serious consideration. However, I would like to raise one area of particular concern to me. It deals with a section titled "Harmful Nonscientific Allegations" which, of course, represents the heart of the Kalb case.

To try and put this simply: it is my understanding that under the current procedures, an investigator would not be informed of derogatory allegations if the program officer deems that the proposal would have been turned down anyway. My question then is: does this not leave the door open for the derogatory material to surface later . . . retrievable by the investigator's name under the new system . . . when that investigator submits a new proposal for review?

ANSWER: In theory it does leave that door open, but in practice, no case has come to my attention where derogatory nonscientific information once discarded was later taken into account in consideration of a another proposal. In particular, the Kalb case does not fit that description. Our problem is that an automatic rebuttal procedure for every case in which arguably derogatory information comes up could put the affected investigators and our own people through a great deal of work for almost no purpose. This is precisely the problem we had most in mind when we said to Public Citizen that at some point the virtues of seeking still more perfect fairness or more complete openness become outweighed by the associated costs to science and the taxpayers.

The choice we have made here is essentially the same as the choice made by the Privacy Act itself. The Act does not require an agency to inform the subject of every possibly derogatory allegation that may appear in agency records. The Act does require an agency to afford such a subject access to records and an opportunity to seek correction of those records; we comply with these provisions.

QUESTIONS SUBMITTED BY SENATOR BYRD

REPLACEMENT TELESCOPE, GREEN BANK, WEST VIRGINIA

SENATOR BYRD: The Congress provided, at my request, $75 million, in emergency appropriations, in the FY 1989 Dire Emergency Supplemental Appropriation bill (Public Law 101-45) for the new state-of-the-art telescope to be constructed at Green Bank, West Virginia, to replace the original telescope which collapsed in November 1988. Twenty-two firms have expressed interest in bidding on a construction contract to design, fabricate, ship, erect, align, and test the new radio telescope. So far, $5 million has been made available for design and engineering efforts, and the remainder of the $75 million appropriation is expected to be made available by the end of FY 1991.

I am told that the requests for proposals will go out in June 1990 and that a contract is expected to be awarded early in 1991. Further, site preparation activities, such as the excavation and construction of the telescope's foundation, should take place in the summer and fall of 1991. Construction of the antenna would begin in 1992. The assembly and erection of the antenna would occur in 1993. The antenna should be completed in 1994 at which time related equipment would be installed and tested. Operations are anticipated to begin in 1995.

I am pleased that this project is moving forward on schedule. Its completion will keep West Virginia in the forefront of radio astronomy. I understand that the new Green Bank Telescope will be unique in the world and have the capability of viewing more of the sky over a greater frequency range and higher sensitivity than any other existing telescope. Since it is to be located in a radio-free zone, it will be virtually free of unwanted interference and extraneous signals. Its precision will be such that it will be able to be targeted on a penny from farther than 2 miles. Data distribution will be accessible over high-speed computer networks to any location.

Because of the scientific importance of the Green Bank Telescope, I would like your assurances that the National Science Foundation will monitor this project very carefully to ascertain that its design and construction are carried out in the most expeditious manner. For the record, please provide the current status of the project and a list of the significant milestone events leading to the full operational status of the telescope. Your cooperation is very much appreciated.

ANSWER: Associated Universities, Inc. (AUI), the contractor for the National Radio Astronomy Observatory (NRAO), submitted a proposal for the construction of the Green Bank Telescope (GBT) in June 1989. The proposal was reviewed, and the National Science Board (NSB), in October 1989, approved $4,140,000 for design study and definition of parameters.

In December 1989, NRAO published, in the Commerce Business Daily, an announcement of intent to build the GBT and invited companies to indicate their interest in the construction. All interested parties currently receive material to keep them informed on design developments. The Division of Astronomical Sciences (AST) of the National Science Foundation organized an outside review of the proposed design parameters in February 1990. It is expected that a formal call for proposals for the final design, fabrication, and assembly of the telescope will be issued in June 1990. As soon as the cost estimates and design parameters are well defined, NSB approval of the construction will be sought.

Award of a contract is expected in the spring of 1991 at which time long-lead items will be purchased and the detailed time schedule worked out. Site work will begin in 1991, manufacture of the antenna in 1992, and assembly and erection is planned for 1993-1994. The telescope, after testing, will become operational in 1995.

The NSF is monitoring this project carefully to assure that the design is at the forefront of current technology and that the project is carried out expeditiously.

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY (LIGO)

SENATOR BYRD: The FY 1991 budget request includes $47 million to begin a four-year construction project to build a Laser Interferometer Gravitational Wave Observatory which has a total estimated cost of $192 million. I am told that scientific teams have been working for the past decade and have successfully met milestones to demonstrate the scientific feasibility for a laser interferometric system. Parallel foreign projects are proceeding rapidly, and the United States should be able to play a large role in shaping a cooperative effort to open the field of gravity wave astronomy. In the United States, a collaborative venture between California Institute of Technology and the Massachusetts Institute of Technology is designing a LIGO. This project will consist of two detectors, widely separated within the continental United States, each having an L-shaped configuration with arms about four kilometers in length. Two identical, but widely separated, detectors are needed to verify the existence of gravitational waves. To locate the source of a gravitational wave signal on the sky requires a minimum of four geographically separate, but technically compatible, detectors. Two European collaborations (United Kingdom/Germany and France/Italy) are planning detectors of compatible design and similar costs to the LIGO facility. They, along with the two U.S. detectors, would provide the geographic dispersion required for source detection.

I am advised that in the first year of work on LIGO that the focus will be on design work and procurement of components for the first of two sites. This will include development of a site plan and earthwork, design of corner, end, and midstation buildings, and engineering for vacuum systems, beam tube modules, vacuum chambers, and monitoring and control systems. In addition, work will continue on interferometer design and testing.

As you may recall, Green Bank, West Virginia has received some initial consideration as a possible site for the LIGO. I would be very appreciative if the Green Bank site could receive very careful consideration during the review process leading to a decision on a site for the LIGO. Green Bank has the advantage of having on site the nucleus of a fine technical and engineering team which could be utilized in connection with the LIGO. May I have your assurances that West Virginia will be considered as a possible site for this project? Please provide for the record the current status of the project and a list of the significant milestone events leading to the completion of the project.

ANSWER: Until the construction proposal for LIGO is reviewed and approved by the National Science Board, no site selection process can be initiated. After that review and approval Caltech will develop a detailed process for evaluating candidate sites and making a final selection. The plan will be reviewed by the Foundation to insure that the process will be rigorous and thorough, and that the highest standards of scientific and technical review are applied. The selection criteria must include scientific merit, site availability, construction suitability, and costs, as well as environmental and cultural impacts associated with facility construction. Several candidate sites have been identified (including Green Bank), none has been assigned priority to the exclusion of others.

A summary of the significant milestone events for the project include:

Proposal to NSF	December 1989
NSF Review	January-May 1990
NSF Approval	May 1990
Procurement of long lead items	Fall-Winter 1990
Site Selection	Fall-Winter 1990
Engineering Design	January 1991-spring 1991
Site 1 Construction	January 1992-December 1993
Site 2 Construction	January 1993-December 1994
Interferometer Installation	January 1994-December 1995
Site 1 Ready for Operations	January 1995
Site 2 Ready for Operations	January 1996

QUESTIONS SUBMITTED BY SENATOR HATFIELD

SENATOR HATFIELD: I am pleased to see the increased emphasis on education and human resources in the FY 1991 budget request of the National Science Foundation, particularly in the pre-college programs. As you know, I have a long-standing interest in upgrading mathematics and science education at the earliest grade levels. Please provide the Subcommittee with an explanation of NSF's position on science education at the pre-college level, and a list of NSF-sponsored activities in this area. Furthermore, please include the amount of funding which has been expended since FY 1987 on these efforts.

ANSWER: Since the renaissance of the Science and Engineering Education Activity in 1984, the pre-college level has been one of the top priorities among NSF's educational programs. Funding for pre-college programs has increased 126% from $62 million in FY 1987 to $140 million in FY 1990. The FY 1991 request at the pre-college level is for $165.1 million.

The following list denotes precollege funding within NSF subactivities since FY 1987 (in millions of dollars):

	FY87	FY88	FY89	FY90	TOTAL
Teacher Preparation & Enhancement	**$30.49**	**$45.53**	**$63.66**	**$81.00**	**$220.68**
Materials Development, Research, and Informal Science Education	**29.48**	**37.81**	**43.99**	**48.00**	**159.28**
Studies and Program Assessment	**2.20**	**3.24**	**4.50**	**4.37**	**14.31**
Research Career Development	**--**	**3.63**	**7.00**	**7.00**	**17.63**
Total	**$62.17**	**$90.21**	**$119.15**	**$140.37**	**$411.90**

SENATOR HATFIELD: I am also interested in the status of communication and coordination on science education between NSF and the Department of Education. Please provide the Subcommittee with an explanation of your efforts to coordinate activities with the Department of Education and an overview of your plans to continue this cooperation in the future.

ANSWER: In the past several years, coordination between NSF and the Department of Education has centered around the following activities:

- FUNDING FOR EDUCATIONAL TV - for some years the NSF and Department of Education have been partners in the funding of "3-2-1 Contact" and "Square One TV".

- INTERNATIONAL COMPARISON STUDIES - since 1978, NSF and the Department have supported international comparisons of student achievement in school science and mathematics.

- NATIONAL CENTER FOR EDUCATIONAL STATISTICS - NSF and Department of Education have worked together on a number of educational studies and have co-funded several projects with NCES.

- NATIONAL DIFFUSION NETWORK - A few NSF-supported efforts in instructional materials have been listed by NDN.

Among the informal efforts are the continuing interactions of NSF officers with their counterparts in the Department of Education. The Director of NSF has met several times this year with the Secretary of Education, Dr. Lauro Carvazos, to explore common interests and specific areas of concern. More recently, NSF and the Department of Education established a formal mechanism to ensure more effective interagency coordination. This mechanism was employed successfully to coordinate review of the solicitation for the Statewide Systemic Initiatives prior to its release. Comments from the Department of Education were welcomed and many of them were integrated into the program announcement.

In addition, OSTP recently submitted an OSTP-Department of Education_NSF report to the Senate that focussed on improving coordination of NSF and Department of Education science, math and engineering education programs.

The future activities of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET) will also lead to increased and substantive coordination among all Federal agencies involved in science education.

SUBCOMMITTEE RECESS

Senator **KERREY**. That concludes today's hearing. The subcommittee will stand in recess until April 5 at 2 p.m. when we'll take testimony from the Federal Emergency Management Agency.

[Whereupon, at 11:40 a.m., Thursday, March 29, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

DEPARTMENTS OF VETERANS AFFAIRS AND HOUSING AND URBAN DEVELOPMENT AND INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1991

THURSDAY, MAY 3, 1990

U.S. Senate,
Subcommittee of the Committee on Appropriations,
Washington, DC.

The subcommittee met at 10:37 a.m., in room SD–116, Dirksen Senate Office Building, Hon. Barbara A. Mikulski (chairman) presiding.

Present: Senators Mikulski, Garn, Grassley, and Kerrey.

EXECUTIVE OFFICE OF THE PRESIDENT

Council on Environmental Quality

STATEMENT OF MICHAEL R. DELAND, CHAIRMAN

OPENING REMARKS OF SENATOR MIKULSKI

Senator Mikulski. Good morning, everybody. This subcommittee will come to order.

We will take testimony from two of the President's executive offices: The Council on Environmental Quality and the Office of Science and Technology Policy. These executive offices are unique in that they serve the President in an independent advisory capacity. In addition, they provide interagency coordination on a myriad of issues.

First, we'll hear from the Council on Environmental Quality. Mr. Deland, this is your first time before this subcommittee and I welcome you. You did a fine job as head of EPA's region I. We're old region III-ers down here at the bay but have parallel problems. I'm sure you're continuing to do so in your capacity as the President's advisor.

Your budget request is $2.78 million, an increase of $1.2 million or 85 percent over your current budget. Most of that is to hire 14 new employees, as well as to initiate a new award program for innovative teachers of environmental issues. We're going to talk about those proposals today, as well as taking a look at what CEQ has been doing in the past year.

So we welcome you. I remember when we talked when you first came in last year—I believe you were appointed very late in the appropriations cycle. We were trying to play catchup with you and so on. So, now, it looks like you've had about 14 months—has it been about 14 months?

Mr. DELAND. It's been 9 months.

Senator MIKULSKI. Nine months? In appropriations we kind of like to take the thing and go another 50 percent if I had my way. [Laughter.]

Mr. DELAND. Sounds fine with me, Madam Chair.

SUBMITTED OPENING STATEMENTS

Senator MIKULSKI. So we look forward to your testimony and why don't you proceed as you care to. First, I will insert my opening statement and any others which may be submitted.

[The statements follow:]

STATEMENT OF SENATOR MIKULSKI

The subcommittee will come to order. Today we will take testimony from two of the President's executive offices: the Council on Environmental Quality and the Office of Science and Technology Policy.

The executive offices are unique in that they serve the President in an independent advisory capacity. In addition, they provide interagency coordination on a myriad of issues.

First, we will hear from the Council on Environmental Quality. Mr. Deland, this is your first time before this subcommittee and I welcome you. You did a fine job as head of EPA's Region I, and I'm sure you are continuing to do so in your capacity as the President's Environmental Advisor.

Your budget request is $2.78 million, an increase of $1.28 million or 85 percent over your current budget. Most of the increase is to hire 14 new employees, as well as to initiate a new award program for innovative teachers of environmental issues. We will explore those proposals today, as well as look at what CEQ has been doing in the past year.

Mr. Deland, go right ahead with your testimony and then we will turn to questions.

STATEMENT OF SENATOR D'AMATO

I am pleased to have this opportunity to review testimony on the fiscal year 1991 budget requests for both the Council on Environmental Quality and the Office of Science and Technology Policy. It is my pleasure to welcome Michael Deland, who chairs the Council on Environmental Quality, and Dr. D. Allan Bromley, Director of the Office of Science and Technology Policy.

COUNCIL ON ENVIRONMENTAL QUALITY

The environment has become a major concern of many Americans. We have a President who has expressed his strong commitment to take an active role in environmental issues. We have witnessed his commitment by his introduction of a comprehensive clean air package last summer. A compromise clean air agreement was subsequently worked out in conjunction with the White House and was passed by the Senate last month.

The President's budget requests for both the EPA and the Council on Environmental Quality also reflect this commitment to the environment. Both requests call for increased funding; and in the case of CEQ, the request amounts to a 90 percent increase over 1990. I look forward to hearing from Mr. Deland about how this increase could strengthen the role of the CEQ as source of environmental analysis in the White House.

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

The Administration has also requested an increase for the Office of Science and Technology Policy. The total fiscal year 1991 request of $3.3 million for OSTP represents a 16.7 percent, or $471,000, increase over the fiscal year 1990 appropriation.

This increase corresponds with the Administration's strong emphasis on research and development—reflected by a record budget request of $71 billion for federal

R&D activities in fiscal year 1991. It also corresponds with OSTP's expanded role in providing advice to the President and coordination among federal agencies on science and technology issues. As our commitment to federal research spending grows, so does the importance of the direction provided by OSTP.

Again, Madam Chair, I welcome our distinguished witnesses, and look forward to reviewing their testimony this morning.

Thank you, Madam Chair.

REVITALIZATION OF CEQ

Mr. DELAND. Well, thank you, Madam Chair. I do appreciate the opportunity to discuss the revitalization of the Council on Environmental Quality with you. I have prepared testimony, but will not consume your time by reading that. I will summarize it very briefly, if I may.

As you know, the President is committed to the revitalization of the Council and, thanks to your support, his request to very nearly double the budget last year was essentially met and, as you have indicated, we are seeking a substantial increase again this year. In our judgment, if indeed granted, that increase would, once again, enable CEQ to fulfill what has been a vital role traditionally over the course of the years.

ROLE OF CEQ

Just briefly, that role, in my judgment, first and foremost, is to serve as the in-house environmental advisor to the President. In that capacity I, as Chairman of the Council, participate actively in the meetings of the Domestic Policy Council, the Economic Policy Council, and attend Cabinet meetings. I cochaired, with Dr. Bromley, whom you know well, and Michael Boskin, the President's Chairman of the Council of Economic Advisors, the recent meeting on global climate change. I participate actively in the Domestic Policy Council working group on wetlands and the like. I do, in those capacities, see the President on a regular basis.

A second facet of CEQ is to serve as an honest broker/arbitrator/conciliator, however you wish to characterize it, amongst the various agencies as they inevitably differ—agencies or departments. That too is a role that we are reasserting over the course of the last 9 months. I expect to play to a far greater extent in the coming months.

Third, as you know, we have responsibility for preparing the annual report to Congress. I read, with interest and dismay, the testimony of my predecessor a year ago and your very understandable concerns about the delays in the preparation of that report. I'm happy to say that we're getting the report back on schedule. We will be publishing it within the next several weeks. It will be out before the end of this month and I think you will find it's a report that does do justice to the issues it addresses.

In this instance, it being the 20th anniversary of the National Environmental Policy Act and the Council, we have taken a retrospective look over the last 20 years at what has been accomplished and then a very brief look at the challenges that lie ahead. As you know, better than anyone else, the Council was allowed to essentially wither on the vine over the course of the last 8 years. I am optimistic that we are now well on the way toward its resuscitation.

NEW INITIATIVES

As to new initiatives, there is the Presidential Awards for Excellence in Environmental Education to which you alluded. This program would grant up to $5,000 for two teachers in each of the 50 States and one in the District of Columbia and Puerto Rico for excellence in environmental teaching. In my judgment, if we indeed are to further the environmental interests in this country and abroad, as we clearly need to do, then we need to look to the next generation for active participation in that. Clearly, teachers are, in my judgment, a largely unrecognized resource; we're hoping to give them the attention that they long have deserved.

The Council, as I suspect you also know, is in the process of being restructured. The President, following the recommendation of the environmental groups' "Blueprint" report, decided not to fill the other two Council positions. There was a markup of legislation in the Environment and Public Works Committee recently which would leave the Council with one member, namely, the Chairman. In order to continue the fostering of additional input and ideas, we are in the process of investigating alternative ways to reach out for outside advice. There are several that are under active consideration.

Looking a bit more to the future, one of my very highest priorities is in the area of pollution prevention. I think the statutes of a command-and-control nature, which the Council was instrumental, under Russell Train's leadership, in devising in the early 1970's, the original Clean Air Act, the Federal Water Pollution Control Act of 1972, have served us well, as have their successor statutes. But I think the time has come, and long since come, for us to begin to shift emphasis to the other end of the pipe, namely, the front end—what's going into it and how the enormous volumes of pollution that we, in this country, continue to generate can be ratcheted down and ratcheted down dramatically. So that is as high a priority as I have.

Along with that, energy efficiency is clearly of interest—something that this country needs to address in a forthright fashion. I've been working closely and cooperatively with Admiral Watkins, Secretary of the Department of Energy, toward that end.

Those, in short form, are the issues which are of prime importance to me. I should stress that, along with those new roles, we need to be ever diligent in remaining as the guardians of the environmental impact statement process under the National Environmental Policy Act.

[The statement follows:]

Statement of Michael R. Deland

Mr. Chairman, members of the Subcommittee, I appreciate the opportunity to appear before you regarding the Council on Environmental Quality's (CEQ) budget for fiscal year 1991.

The Council on Environmental Quality is celebrating its 20th anniversary, having been created with the signing of the National Environmental Policy Act (NEPA). NEPA set out several missions of critical importance for the Council in 1970. At this

20-year milestone, the Bush Administration has recommitted itself to the principles and goals of that seminal environmental law, and with that, to the revitalization of CEQ.

President Bush has expressed his personal commitment to me in strengthening CEQ to ensure that it has the capacity both in terms of resources and access to serve as an effective source of environmental analysis and information in the White House. I am pleased to say, that as part of that commitment, the President's Budget continues the strengthening of CEQ that began in fiscal year 1990. The Administration is asking for a 90 percent increase in CEQ's budget for 1991.

This increase will allow CEQ to regain the capacity to serve as an adviser to the President on environmental issues, to ensure that Federal policies and activities are consistent with the National Environmental Policy Act, to provide coordination among agencies on key issues such as wetlands and global climate change, and to report to the Nation on the state of the environment and related indicators.

The Council on Environmental Quality, which includes the Office of Environmental Quality, is requesting budget authority of $2,780,000 for fiscal year 1991 and a personnel ceiling of 34 FTE's. This amount will increase our capability to meet the important responsibilities given to the Council under the National Environmental Policy Act and expected from us by the President and by the Congress.

CEQ provides a means for incorporating an environmental perspective in the Executive Office. CEQ also serves as a source of environmental expertise for other organizations within the Executive Office of the President and provides for coordination and policy analysis of environmental programs of the federal government. Let me mention briefly the range of CEQ activities.

CEQ advises the President on national and international policies to foster and promote the improvement of environmental quality. As CEQ Chairman, I participate in meetings of the Domestic Policy Council, the Economic Policy Council, and select meetings of the National Security Council. I was a Co-Chairman of last week's White House Conference on Science and Economic Research Related to Global Change, and I am a member of the Domestic Policy Council's Working Group on Global Climate Change and on the Domestic Policy Council's wetlands task force. As requested by the President, CEQ analyzes and makes recommendations on policy and legislation.

CEQ is in a unique position, because of its trans-agency perspective, to provide general leadership and support to the coordination of activities of the federal departments and agencies which affect, protect and improve environmental quality.

CEQ prepares the President's annual Environmental Quality Report to Congress. In response to complaints regarding its timely publication, I have pledged that CEQ will ensure the expedited preparation of the report.

CEQ oversees federal agency implementation of the environmental impact assessment process. CEQ promulgates the regulations which implement the overall federal requirements for all agencies in the executive branch. CEQ is the final administrative authority interpreting the federal environmental impact assessment requirement and referees interagency disputes on the conduct of these assessments. CEQ has encouraged recognition of environmental impacts of major federal actions conducted abroad, and is currently chairing an interagency task force to focus on this issue.

CEQ serves as a bridge between the Administration and the private sector in promoting the attainment of environmental quality. CEQ fosters cooperation between the federal and local government, the private sector and the environmental community.

I am very pleased that the President has designated CEQ as the agency to administer a new environmental initiative for fiscal year 1991, the President's Awards for Excellence in Environmental Education. This program will recognize elementary and secondary school teachers who incorporate the most innovative and effective programs to teach students about the environment into their curricula. The award will include a cash award of up to $5,000.

In 1991 CEQ will continue to provide leadership in areas of critical environmental concern including global climate change, preservation of wetlands, pollution prevention and energy efficiency, the analysis of environmental quality indicators and trends, international development issues, and biological diversity.

My charge is to instill respect, credibility and spark into CEQ; to take the best of the old CEQ while at the same time reshaping it to better meet the needs of the White House and to better meet the demands of emerging environmental priorities. In rebuilding the Council we must focus on how it can best meet its important statutory mandate. I believe we are making very real progress. The President's Budget is an important step toward accomplishing that goal.

I would look forward to discussing this with you further and answering any questions you may have.

Thank you.

INCREASE IN BUDGET AND PERSONNEL

Senator MIKULSKI. Well, thank you for your testimony. As we go into the questions, first of all, I'm very pleased that the President appointed you to this position. I know that there were those, even within his own councils who discouraged that because of the management style, shall we say, that you had in the New England region, and to have someone who has a strong commitment to the environment but understands the bureaucracy and has had to try to implement Federal policy, you know all the potholes that exist. You know how Congress can have good intentions but, by the time it gets to regions or has to coordinate with the Fish and Wildlife Service and all of those things that a regional director does, I thought it was excellent that the President put at the highest level someone who had not only a commitment to the environment, because we didn't need another think-tanker, but someone who'd actually been involved in implementing environmental policy at State and local levels.

Obviously, not only do you wear the cuff links of the President but that you've had an opportunity to go in and really talk with him, which says a lot about you and says a lot about our President's commitment to this. So, having said that then, we'll go through some of these questions so that you have the tools that you need and we can use our resources wisely.

You talk about the need for 14 new employees. That would be a substantial increase. What will that increase allow you to do that you're not currently involved in, or what will that increase allow you to do that you'd like to do better, and perhaps dig in more? As you know, 14 is a lot for an agency your size.

Mr. DELAND. It is a lot. But, to put it in perspective, the numbers over the course of the years have ranged between 55 to 70 employees, somewhere in that range. When I arrived on scene last August, I found nine employees in the shop, a decided decrease. So we are in a mode of building back up to what I view to be a critical mass, which will enable us to participate across the environmental spectrum.

I would expect to add some expertise which we now do not have in the scientific area. That said, we work very closely with Dr. Bromley and his staff, but it would be helpful to me to have someone in my immediate shop, layman lawyer that I am, who can be a translator and, hopefully, contribute a bit more, in the scientific arena.

We have just added a Ph.D. economist to the staff. Again, I stress that we work closely with Dr. Boskin and his organization, but I do think it's important that we have our own small cadre of experts in those areas.

Senator MIKULSKI. What would they do? I mean, are they going to be doing more studies? When they come in, what are you going to ask them to do?

Mr. DELAND. Serve in an advisory role in a myriad of issues. For example, the economist, who just joined us very recently, is already fully immersed in analyzing the economic consequences of pollution prevention and so is giving me a first-hand report as to what those ramifications are. That is really essential to me in my giving the President what I view to be sound and solid advice. I feel that I need to advise him from all perspectives.

That said, the name over the door is the Council on Environmental Quality—and I recognize what our primary mission and role is—but in order to give balanced advice, I think we need to have those disciplines represented.

Senator **Mikulski**. Certainly. We understand. That's why I was just asking though what kinds of things that those 14 people would do as compared to, say, 5 people. This is the point of the question.

Mr. **Deland**. Well, I can give you specifics as to issues, if you would like.

STRATEGIC PLAN

Senator **Mikulski**. What I would like to do, because we want to move on with you and with Dr. Bromley, is to get specific information from the staff and it can be discussed here. Also, we know that for many instances that you're either a second opinion for the President—and I mean that almost in a medical sense, where he hears so much and he needs an independent second opinion on whether he should do surgery in clean air or something else like that—or in some instances, you'll be the first opinion for the President, to give him a heads up on emerging environmental issues that could have significant consequences for our country or for the planet, which then says to us—and also the fact that the agency has been lackluster in the last couple of years—what do you see as a strategic plan for your agency?

Mr. **Deland**. Well, if by strategic plan, you mean objectives, as I said, first and foremost in my mind is what I view to be a major restructuring in the way we conceptually view the environment. That restructuring would be to emphasize or shift the emphasis toward pollution prevention, waste minimization, however you want to characterize it. That won't come easily. That will require, in my judgment, much more than simply Federal fiat or edict or statute from any level of government. I do endorse pollution prevention legislation that is now in the drafting stages within the Environmental Protection Agency, but I feel that if we are to be successful in that, we really need to change the country's mindset, need to reach out to the private sector, harness—capture the creativity and imagination from that segment of our society.

I view us, CEQ, as playing a critical and catalytic role in that endeavor. I have met recently with the chairmen of many of the country's major companies—DuPont, 3M and the like—and they all have programs, to varying degrees, underway. But what I would like to do is to serve as a clearinghouse for the best of those ideas and to see if we can't build it in to the national environmental ethic.

RISK PRIORITIES

Senator **Mikulski**. Well, I think that is quite an ambitious undertaking. Let me share with you what I asked Mr. Reilly and then as you organize your work for the coming year, are priorities based on risk to the people?

If you could go back up to your days at region I, the kinds of calls that you got, we find, for example, a tremendous amount of money is going into those that could use up a lot of capital, which is related to outdoor pollution, and yet, at the same time, we know that a pressing need is indoor pollution. When we talk about risk, it's not only health but it's to the vitality of the communities so that, while everyone wants to talk about dazzling international issues, of which this group has a strong commitment—to global warming and how to link NASA and science and so on to this—mayors and Governors are on Rolaids over garbage.

Certainly, we've got recycling and so on. It is really, I guess, the priorities that could do the most good creating an environmental effort. I was so glad to hear you use that word. We're all supposed to be environmentalists, just not a President or a Congress, and that every day should be Earth Day. It's not to give you speeches, sir. You certainly don't need that from me. You see that I think it would be useful for the President to hear that. He will always get what the Washington Post is writing about. But then there's that next thought, that Governors grumble about or that citizens feel frightened over, you know, the scare-a-week kinds of situations that we hope you would take.

The other question that I have relates to coordination. There are 32 agencies, as I understand it, that are involved in environmental protection. It's not just you and EPA. I'm sure the issue of coordination is a significant one. Would you tell us what your plans are on that and if some of this new staff will be involved in that?

Mr. DELAND. Yes, Madam Chair. First, to respond to your comments on risk assessment, I heartily concur. I think that really needs to be the foundation of environmental decisionmaking and it, quite frankly, is something that, in my judgment, has been allowed to languish to far to too great a degree. Bill Ruckelshaus, when he returned to EPA in the early 1980's, made that one of his highest priorities and, upon his departure, it was in my judgment not pursued with the vigor that it should have been. I think it really does need to be the underpinning.

Just two quick examples. You look at the way our moneys are being allocated in the hazardous waste area versus some of the areas such as indoor pollution that you mentioned, and I think there's a decided imbalance there. In my judgment, yes, we do have a major residual hazardous waste problem from the ill-advised dumping of the past. Nonetheless, if you analyze that from a risk basis, I think you can say with some certainty that there is very little, if any, imminent threat to public health from the Superfund sites that have been identified around the country. They have been contained; they are being carefully monitored.

My personal feeling is that we would spend our moneys much more wisely if we move to a containment policy and then sought to destroy those contaminants on site as the technology became available. The technology, happily, is very quickly catching up. For all too long, the Environmental Protection Agency was in the business—and I was a party to this—of moving pollution around. You had a hazardous waste site in New England that needed to be cleaned up and so what did you do—you dug it up and trucked it to a double-limed landfill in Ohio and Utah and someplace else.

My feeling is that that will simply create a Superfund problem for a generation hence. Those landfills are not going to maintain their integrity forever. So I don't think that's a sensible approach. Several EPA studies have addressed that. I would much rather see us focus to a greater degree on risk. I think if we did that we would then be looking to a far greater degree to such issues as indoor air pollution, lead and its impact on children, and some of the other issues that I know you're familiar with.

As to the personal aspect that you mentioned, I think you're absolutely right. We have an interesting dichotomy—the globalization of the environmental movement on the one hand, with issues such as global climate change. But, in my judgment, if we are to solve those enormous global problems, we need to change lifestyles here at home, focusing on issues you've raised such as recycling.

We have a deplorable record in this country. We recycle at someplace between 8 percent to 10 percent of our garbage. The West Germans are recycling at 40 percent, the Japanese at 50 percent. So we have a long way to go.

INTERAGENCY COORDINATOR

Senator **Mikulski**. Could you just tell me what you're going to do on coordination?

Mr. **Deland**. Yes; what we will do there is to continue to work actively, both in formal settings, namely, within the Domestic Policy Council meetings, Economic Policy Council meetings and informally, as I've been doing with individual secretaries, whether it be with Admiral Watkins in the development of his energy strategy or with Secretary Skinner on the development of transportation strategy, in that all of those clearly have an environmental component. So that coordination will continue, as I said, both formally and more informally on a case-by-case basis.

Senator **Mikulski**. Senator Garn?

NEED FOR CEQ AS IN-HOUSE PRESIDENTIAL ADVISOR

Senator **Garn**. Thank you, Madam Chair. I'm only going to have one question. So I'll take a little bit of time to explain so that you don't misunderstand. I certainly think you're a fine choice for this position, and certainly the issues you're dealing with, there are no more important issues in this country.

But I really have a hard time with why the Council on Environmental Quality exists. The reason that I say that is you're dealing with environmental issues that are scientific and technical in nature. We have the Office of Science and Technology. Then we have the Council of Economic Advisors focused on the economic aspects. We have OMB; we have EPA. The list goes on and on. Senator Mikulski mentioned 32—or you did. One of you mentioned 32 different agencies. I'm not just picking in this area. I'm looking at the whole area of Government.

In the 23 years I've been involved in Government, and 16 years around here, I've seen this over and over again—look at Defense. We used to have a Secretary of Defense and we had a Secretary of the Navy and Army and they advised the President. We've created an Office of Secretary of Defense with over 4,000 staffers. So you've got all these people around. I don't know what they're doing down there but they cause enormous delays. I don't know what good a Secretary of the Navy or Air Force or Army is any more. They've got to go through all those people before they talk to the Chairman of the Joint Chiefs of Staff.

In the four Presidents I've served with, I've seen every President add to his personal staff. Now maybe I don't understand the system but I've been around here long enough to know how long it takes to get anything done, how long it takes to have all these interagency meetings. I can remember after the *Challenger* accident, where they couldn't make a decision on anything because they were holding so many coordinating meetings. They couldn't even make a decision on whether we needed a replacement orbiter. Finally, Senator Ted Stevens and I just put in the appropriations bill—we're buying one, and cut through all their process.

I see the same thing with all the talk about the problems and we don't want your solid waste in Utah. We don't want any more incinerators or all of that. The problems are real; they are serious; they're getting worse all the time. What I mainly see is, in all these other areas, I see such a huge bureaucracy in the Federal Government and here too. We have increased our staff dramatically.

So my question is, Why do you exist? Not just you, but if we have an EPA, shouldn't that be—Mr. Deland is appointed; Mr. Reilly is appointed. He has to come before the Congress for confirmation. The President picks him. I'm not picking on you personally, but the whole situation I've seen grow out of the Executive Office of the President and other bureaucracies, you will spend most of your time—not as an expert on trying to clean up the environment—you'll spend most of your time on the Senator's last question—coordinating—while the environment continues to deteriorate, despite your good intentions. Despite all of it, you will find you'll look like me because your hair will be gone from tearing it out in frustration of trying.

Mr. DELAND. It has grayed considerably in the last year.

Senator GARN. Well, take any color. I'd take any color; I don't mind that. But you will experience great frustration in trying to bring all these acts together while nothing seems to come out at the other end of the pipeline. So I'm really going far beyond looking at a whole structure that I don't understand, that I think impedes progress in a number of areas. But is it really necessary to have your office and have requests for additional people rather than having a President who says, I really want to accomplish something, whether it's this one or another, and we don't need 32 agencies dealing with the environment. I want to reduce those so you don't have to hold all those interagency meetings. I want to hold the Director of EPA accountable; he's my environmental man and he's the one that's responsible to pull all this together and I want action; I want these dumps cleaned up.

I get incredibly frustrated because of all the meetings that I attend and they're just meetings. I want to see that toxic waste cleaned up. I don't want to see it. An expert like you shouldn't have to spend most of your working day trying to cut through all the morass and coordinate these activities. Maybe it's you that ought to run the whole thing and downgrade EPA; I don't know. But is there some way we can get somebody who can make some decisions that don't take a whole career. I mean I've watched things not happen around here into my third term in the Senate.

It's very much like when I was mayor. I realize a city is nothing compared to even one department of the Federal Government. But, to make it very simple, so that I'm not misunderstood at all, I had a police chief, a fire chief; I had a director of environmental quality; I had a planning and zoning director and all of these. I can't imagine, as mayor, having appointed all of these people, and now I want to create a staff within the office of mayor to interpose between them and these department heads. They were accountable and responsible to me. If they didn't do their job, I'd get another one. It's like maybe I created 300 people in the office of the mayor to coordinate the activities of all these things.

So a long statement, only one question: Why are you necessary? Not you personally but another office in the White House.

Mr. DELAND. Well, your statement falls on receptive ears from a philosophical standpoint, Senator. But I think that as long as there are substantial bureaucracies, as you have indicated, there is an essential need within the Executive Office of the President for an entity that can reach across those various departmental lines.

You mentioned the Department of Defense, obviously an enormous bureaucracy. But the President does have within the White House the National Security Council that is able to give him up-to-the-minute advice on defense matters.

Senator GARN. Isn't that what the Secretary of Defense is for?

Mr. DELAND. When you look at the environment, for example, it goes far beyond the bounds of just an Environmental Protection Agency. We know now that it's inextricably intertwined in energy matters and transportation matters and responsibilities with the Department of the Interior, Department of Commerce, virtually every one of the Federal departments.

I think there is an essential need for an entity reporting directly to the President who has the responsibility to give him advice that is gleaned from all of those various constituencies. Similarly, as Dr. Bromley coordinates the scientific efforts of the Federal Government, I think there is that very same comparable kind of need on environmental issues. There's a Department of the Treasury, just as there is a Council on Economic Advisors. I submit that there is a need for a lean, quick-to-respond entity reporting directly to the President that can give him advice on the crises of the day and also as a long-range think tank for him.

Senator GARN. Well, I might agree with you if you really had the power to cut across those boundaries and short circuit. But you don't in the Cabinet form of government. My frustration is the years that go by and the lack of action that happen in a number of ways.

If I were President—and I never will be; nobody needs to worry about that, even if I wanted to be; I'd never get elected. So that's not a concern—very hypothetical situation. I really would start with exactly what I've said. You would see terminations in that

White House, in the Office of Secretary of Defense. If we've going to have Cabinet government, I would establish responsibilities with those people that are very high level and high profile, hold them accountable for that. I think all your intentions are good. Again, I'm not being personal at all. I've heard so many of the people come up in these various agencies over the years. Rather than short circuiting, cutting through the redtape, at least while I've been here, it has been worse. That is one of the major reasons we get so much criticism as a Federal Government. It takes so long and is such a difficult process to coordinate these activities. So I don't see an alternative. Regardless of how good the intentions are, I would like to really cut all of that out, where possible. I think the President would be better served to go back to a simpler structure with trusting those who he picks as Cabinet officers.

Mr. **Deland**. Well, now, if you assume that a simpler structure does make sense—and I think we all might agree on that—but until such time as that structure is in place, I would submit that 34 people within the immediate office, Executive Office of the President, are essential to cut across all of those disparate and differing lines that, as we know, are inextricably intertwined.

Senator **Garn**. Well, that is the reasoning I've always heard and so I've watched it mushroom over the years because, until we're able to change it more fundamentally, we must have these. We have used the exact same reasoning to increase congressional staffs by 300 percent since I have been in the Senate. So we're as guilty as the executive branch.

Thank you, Madam Chair.

Senator **Mikulski**. Senator Kerrey?

Senator **Kerrey**. I have no questions.

Senator **Mikulski**. You're sure?

Senator **Kerrey**. I'm sure.

Senator **Mikulski**. Feeling all right?

Senator **Kerrey**. Feeling fine. [Laughter.]

ANNUAL REPORT

Senator **Mikulski**. Let me just ask that you get to two points and move on to Dr. Bromley.

First, the now famous or infamous environmental quality report. I understand that you are working very hard to issue this, to play catchup with these overdue reports, these reports that have been overdue in the past. According to page 4 of the justification, one of your first duties is to produce the environmental quality report.

My question is, What can we expect from you and also, do you really think this report is needed?

Mr. **Deland**. That's a good question, Senator, and one of the very first ones that I examined closely when I took office. I not only made inquiries here in this country but canvassed the international arena. I was surprised, and pleasantly so, to the degree with which that report is valued in foreign nations.

There has seldom been a minister of environment from another country come to my office who hasn't asked about that report. It has indeed served a very valuable function over its 20-year history in furthering environmental interests worldwide. I think it's something that needs to be maintained.

We are clearly in a catchup mode. When I arrived on the scene last August, the report, as you well know, of the previous 2 years had not been issued. That one, happily is out. As I said, ours, for this first year of my tenure, will be out within this month. Next year we'll be back on a schedule which will have it issued early in the new year, which I think is a sensible time.

I do think the report itself provides an opportunity for us to examine, as a country, where we ought to be headed. The report then serves as a basis for international guidance and deliberation.

ENVIRONMENTAL EDUCATION

Senator **Mikulski**. Then we'll look forward to that. You know, I've made rather tart comments to your predecessors but it was because, again, of the sluggish nature that they performed. So we look forward to the timeline and so on.

We had a group of international parliamentarians here in a meeting and it would have been fantastic if we had had these up-to-date reports, and particularly over 3 years, et cetera, et cetera.

My last question will go to environmental education. I know you want to create an ethic of environmental concern and so on. When we talk about coordination, have you met with Administrator Reilly and Education Secretary Cavazos on environmental education, when you talk about your coordinations?

Mr. **Deland**. I have met with Administrator Reilly on a regular basis. I have not specifically talked about environmental education with the Secretary of Education, although I have talked with some of his staff and certainly plan to talk to him personally on that very soon.

Senator **Mikulski**. Well, I think we're very reluctant to get into an awards-granting program until we see how this will then work between his agency and your Council, not because we don't believe that teachers should be recognized; in fact, some of the best teachers should be teaching other teachers because one of the needs is retooling. I would really commend to your attention, sir, a recent OTA report on how to improve science and math people, "From Grade School to Grad School." It talks about the enormous problems of getting kids scientifically aware and, you see, the environmental education component would be a natural.

When kids are out there taking little tests on water quality and so forth, that's math; that's science. That's what we're going to be talking to Bromley about. Right now the question would be, are there other awards; are there other grants? Also, is there a clearinghouse on environmental education? Is there a clear policy? Do the people over at Department of Education even know what the hell environmental education is? They're doing a lousy job on math, science, and education.

Mr. **Deland**. We are trying to help raise the level of consciousness within the Department of Education on that. In partial response to Senator Garn's question, I have met more frequently with Admiral Watkins on environmental education, given his interest in furthering science and math education. There clearly is a link there. I feel strongly that this program, to recognize the teachers who are leaders in each of the States, will pay rich dividends for this country in years to come.

Senator **Mikulski**. Well, I will have to be convinced of that. I want to set that clear. Again, I believe in recognizing and rewarding teachers. But I'm concerned that this is too few for too little. The fact is we'll get out $5,000 to a teacher but we won't have an inventory of ideas; we don't have a clearinghouse on what really works in environmental education. I don't know if that's your job or Bill Reilly's.

Certainly, for this year I think we would have concerns about funding that until we have a really clear idea on where we're heading with environmental education, and then how that coordinates with math and science and that we would create our own synergistic effect.

I think Admiral Watkins is doing a splendid job. He's doing more for education than the Department of Education. I sit on the Kennedy committee, so I kind of see it all. I don't wake up at night saying, wow, I can't wait to go tell my constituents about the good things we're doing.

If we're not doing it in math and science, where there's a body of knowledge even how to teach it and how to communicate it, I'm not so sure there is one on environmental issues, and then to create some kind of off-agency, if you will, for awards, then we're making you the Department of Education. We've now got Admiral Watkins as the shadow Secretary of Education. I'm wondering what the hell the Department of Education's about and how this would work.

I would like to encourage you really to pursue the development of a policy on environmental education and share this with us as we then mow through it. The awards technique might be a great technique but I'm very reluctant to create an awards program until we have a policy of which this would be a component.

Mr. **Deland**. I understand, Senator.

Senator **Mikulski**. I really would encourage you to do that.

Mr. **Deland**. We will delve into that and report back to you. I feel that this, until such time as a more comprehensive policy could be fleshed out, would be a very important start in the right direction. I have talked with Bill Reilly and with Admiral Watkins on this issue specifically so I think there is, in my judgment, a case that can be made.

Now, clearly, with a program of that magnitude, we're not going to turn the entire country's environmental education structure around. But I think we can highlight those who really have been performing a critical and useful service and, hopefully, have them serve as inspiration for others. That's the fundamental intent.

I will speak with the Cabinet members that you've mentioned and others and get back to you.

Senator **Mikulski**. Well, I'm interested in lighting the fire in the bellies of the general student population to become interested and oriented to a technological environmental society. In order to do that, we have to recruit excellent teachers and retool the ones that we have. I see no national policy, no national strategy, no action plan to do that. I see uncoordinated events and I see a lot of press, but I don't see performance of policy. That's truly what I'm looking for.

So I have a lot of confidence in you. This is the OTA report on science and education. It's really excellent. It's not specifically addressed to the environment issue, but I think it offers a lot of insights and good observations and good analysis.

We thank you.

Mr. DELAND. Thank you, Madam Chair.

ADDITIONAL COMMITTEE QUESTIONS

Senator MIKULSKI. Thank you. We will be submitting the balance of the questions to you for your response.

[The following questions were not asked at the hearing, but were submitted to the Council for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR MIKULSKI

1. BUSH ADMINISTRATION

How has CEQ's role changed in the Bush administration? What specific new responsibilities has CEQ taken on?

Response:

CEQ is now, with the President's support, beginning to reassert itself in the several important roles set out under the National Environmental Policy Act (NEPA). These include the role of Presidential assistant and advisor, of developer and advocate of particular national environmental policies, and of overseer of the environmental impact statement process.

The additional responsibilities taken on by CEQ all relate to existing statutory duties. Specific examples of CEQ's fulfillment of these responsibilities include:

o coordinating interagency policy meetings on issues such as Western water rights and wetlands protection;

o administering the federal government's environmental assessment program through the annual Environmental Quality Report;

o co-hosting an international White House Conference on Global Change;

o chairing an interagency task force on the extraterritorial application of NEPA;

o participating in meetings of the Domestic Policy Council and the Economic Policy Council;

o hosting an important bi-lateral conference following the May, 1990 Bush-Gorbachev Summit under the U.S.-U.S.S.R. Agreement on Cooperation in the Area of Environmental Protection;

o drafting U.S. position papers in preparation for the 1990 Economic Summit of Industrialized Nations; and

o serving as members of U.S. delegations to international conferences and negotiating sessions in a variety of areas including international environmental assessment, Antarctica policy, biotechnology, and climate research.

2. 1989 Accomplishments

How does your role on the Task Force on Outdoor Recreation Resources and Opportunities that produced the report, "Outdoor Recreation in a Nation of Communities," fit in with CEQ's role? What was the Reagan administration's "recreation policy?" Is this the sort of thing you will be using your 90% increase for?

Response:

CEQ Role on Task Force

President Reagan's Commission on Americans Outdoors issued its report and recommendations in January, 1987. In its report, the Commission concluded that people were increasingly looking for recreation opportunities close to home and that the way to meet this need was community by community.

To act upon the findings and recommendations of the Commission, the interagency Task Force on Outdoor Recreation Resources and Opportunities was chartered by the Domestic Policy Council in August, 1987. Jacqueline E. Schafer, a member of the Council on Environmental Quality, was selected to serve as Chairman of the task force.

The task force was made up of 14 separate federal agencies, and included other representatives from the White House. CEQ's role on this task force was entirely consistent with and in furtherance of its statutory role

> "to review and appraise the various programs and activities of the Federal Government in light of the policy set forth in title I of this Act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto...." NEPA, Section 204(3).

President Reagan's Recreation Policy

The task force, in its report for the Domestic Policy Council and President Reagan, recognized that the federal government has become a massive provider of outdoor recreation opportunities by virtue of it vast landholdings. Where the federal lands are close to communities, they expand the recreational choices the people living in those communities may enjoy. The report concluded that the proper federal role in these instances is to cooperate with state and local entities in assessing the resources suitable for recreation development and in making federal lands available for expanding local recreation opportunities.

For the vast majority of communities which are distant from federal landholdings, the report found that the proper federal role is to cooperate with localities and states in the protection of environmental quality in general, in the protection of private property rights, and in removing unwarranted regulatory obstacles to those who are able to provide recreational opportunities in the area. In addition, it concluded that the federal government should recognize those successful individuals, enterprises, and voluntary organizations that have shown leadership and initiative in creating and expanding recreation opportunities and resource protection in order to exhort and encourage others to do the same.

Increased CEQ Funding in the Bush Administration

Our FY 1991 Budget Request indicates that increased funding will be used to support the addition of 14 staff people in order to continue the rebuilding of CEQ which began in FY 1990. President Bush has significantly increased his reliance on CEQ, and additional staff people are needed to assure timely, relevant, and useful information is provided to the President for use in the development of environmental policy.

Funding ($500,000) is also requested for a new Presidential initiative, the Presidential Awards for Excellence in Environmental Education. This program is designed to reward and encourage innovative and effective educational programs which will teach students about environmental protection and responsibility.

3. STRATEGIC PLAN

What is CEQ's strategic plan for environmental protection? If you do not currently have such a plan, when will you? How will you coordinate with the 32 agencies involved in environmental protection in order to come up with such a strategic plan?

Response:

CEQ's strategic plan for environmental protection under Chairman Deland is to:

1. to recognize the enormous progress the United States has made and learn from the experience we have had over the past 20 years in cleaning up the environment and in institutionalizing a variety of pollution control and other environmental protection strategies;

2. to improve the efficiency and effectiveness of those strategies by employing economic incentives in the service of the environment;

3. to shift the Nation's focus to preventing pollution in the first place, rather than controlling pollution after it is generated; and

4. to promote the inculcation of a national environmental ethic which recognizes that all segments of society can make significant contributions to environmental quality and that environmental education is a means to that end.

4. CABINET STATUS FOR EPA

If a Bureau of Environmental Statistics is created in the legislation making EPA a cabinet agency, why would we need CEQ since one of your functions is collecting and analyzing environmental statistics? What other implications does the potential cabinet status for EPA have on the Council?

Response:

A straightforward elevation of EPA to cabinet agency status, as the Administration has supported, would be complementary to CEQ's mission. CEQ would continue to serve as the in-house advisor to the President on environmental matters. We would continue to coordinate the environmental activities of the federal agencies, resolve interagency disputes through the NEPA referral process, and work closely with a Department of the Environment to further the environmental policies of the President.

The pending legislation, however, is not a straightforward elevation. For example, as the Administration indicated during consideration of HR 3847 on the floor of the House of Representatives, that bill contains highly objectionable provisions with respect to the Bureau of Environmental Statistics which raise serious constitutional concerns and severely restrict Executive Branch oversight of the new Bureau. These provisions include:

- mandatory delegation of all information collection, analysis, and dissemination from the Secretary of the Environment to the Bureau of Environmental Statistics;

- prohibitions on departmental review and approval of Bureau data collection, analysis, or dissemination activities and any Executive Branch official review and approval of the substance of any Bureau reports;
- limitations on the removal of the Bureau director from office, i.e., only for malfeasance in office, maladministration, or neglect of duty; and
- miscellaneous provisions concerning the confidentiality of statistical data, advisory panel disclosures, and membership requirements.

The pending legislation directs the Bureau of Environmental Statistics to prepare an annual report which is nearly identical to the current reporting requirements assigned to CEQ under NEPA.

The Administration remains committed to elevating EPA to cabinet agency status, but we believe that, in the interests of the environment, "good government" and conservation of fiscal resources, the legislation should more closely adhere to the concept proposed by the Administration.

5. GLOBAL CLIMATE CHANGE

What is CEQ's role with respect to global climate change policy? Why wasn't the environmental advisor to the President chosen to head up global warming policy? How many new employees have been hired to implement the accord on global change?

Response:

CEQ is a full and equal member of the Domestic Policy Council's Global Change Working Group which directs the President's policy on all global change issues including climate. The appointment of the Director of the Office of Science and Technology Policy as chair of this group reflects the President's view that the role of science in understanding and responding to changes in global systems is critically important.

Various members of the CEQ staff have been involved in the implementation of last year's "G-7" accord, including new staff members who were hired as a result of the FY 1990 supplemental appropriation. Two staff members in particular have been focused on issues relating to that accord.

6. ENVIRONMENTAL QUALITY REPORT

Do you agree that CEQ does not have the resources to do a credible job in preparing the annual report? Do you believe the production of this report continues to be an important function of CEQ? Who uses the report? How do you plan to make the report more "user friendly" in the future?

Response:

With a current budget of approximately $1.5 million and a staff of 18 people, CEQ has adequate resources to prepare the annual report. The CEQ annual report for the year 1989 is being published on schedule this Spring. Work is already beginning on the annual report for the year 1990, and will be published early in 1991.

We believe that the production of the annual report is an important function of the Council. The report is widely circulated and used, judging by the numerous requests we get for the report. It is used not only by congressional staff people and those in other federal agencies, but also by those in the academic community, by state and local government agencies, by environmental lawyers, and by citizens who want to learn more about environmental issues.

The report seems to have been well-received over the years. We are making every effort to chose appropriate issues, to write the report clearly, and to edit the document to make it as understandable and useful as possible.

7. INTERGOVERNMENTAL COORDINATION

Do you agree with CEQ's previous Chairman that intergovernmental coordination needs improvement? Would you say there have been any improvements in this area in the last year? If so, what specific examples can you site? Please list the specific steps, with attendant examples, you plan to take to achieve the highest possible degree of intergovernmental coordination.

Response:

We believe that intergovernmental coordination has indeed been enhanced in the last several months. The CEQ Chairman participates actively in all Domestic Policy Council and Economic Policy Council meetings and in pertinent Cabinet meetings. It is his participation with these groups which provides the best opportunity for formal interagency coordination on environmental issues.

On an informal basis, Chairman Deland works closely with individual cabinet secretaries to achieve intergovernmental coordination. For example, Mr. Deland and Secretary Watkins have met to discuss the environmental ramifications of the Department of Energy's National Energy Strategy. Similarly, Mr. Deland has met with Secretary Skinner to discuss environmental issues involved in a national transportation strategy.

CEQ, through its participation on the Domestic Policy Council and the Economic Policy Council, as well as through more informal means, will continue to strive for the highest degree possible of interagency coordination in order to promote efficiency and to eliminate redundancy with respect to environmental issues.

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

STATEMENT OF D. ALLAN BROMLEY, DIRECTOR

ACCOMPANIED BY:

DR. JUDITH L. BOSTOCK, SPECIAL ASSISTANT

DR. WILLIAM WELLS, CHIEF OF STAFF

BUDGET REQUEST

Senator **MIKULSKI**. We welcome our next witness, the President's Science Advisor, Dr. Bromley. This is your second appearance before this subcommittee this year and we welcome you back.

You're asking for a budget of $3.3 million, an increase of 17 percent over fiscal year 1990. Your budget would allow funding for the four associate director positions you've filled and to increase direct support of the President's Council of Advisors on Science and Technology.

We'll talk about those items today, as well as some of the other interagency coordinating functions. If we have time, we'll go into things like global climate and supercomputing and, of course, science education.

We want to congratulate you on your election.

Dr. **BROMLEY**. Thank you.

Senator **MIKULSKI**. I understand you've been elected to the National Academy of Sciences.

Dr. **BROMLEY**. That's correct.

Senator **MIKULSKI**. Sometime you'll have to tell us how you did that. I mean did you do polls and things like that?

Dr. **BROMLEY**. It's incredibly archaic, Madam Chair.

Senator **MIKULSKI**. We look forward to hearing your testimony and we ask you to just proceed.

Dr. **BROMLEY**. Thank you, Madam Chair.

CHANGES IN OSTP

May I begin by introducing my associates here, Dr. Judy Bostock, who comes from a professorship at MIT through OMB to OSTP, and Dr. William Wells, who spent 14 years on congressional staff and is now professor of management and has been a professor of management at George Washington University and just joined my staff as chief of staff. I'm delighted to have both of them here this morning.

I welcome this opportunity, Madam Chair, to present something about our administration's view on science priorities and specifically the administration's 1991 budget for the Office of Science and Technology Policy.

As I think you are certainly aware, there have been some very important changes in the office since my appointment, reflecting the fact that President Bush has felt that science and technology should and can play a much more important role than they have in the past in the activities of the Nation. The change in my position to that of Assistant to the President for Science and Technology has made it possible for me to serve as a member of the various Cabinet groups, the Economic and Domestic Policy Councils, the Space Council, and the Competitiveness Council, and I work closely with the National Security Council.

Of course, as you well know, Madam Chair, if you have all the money, you have a great deal to say with policy, so I have spent a considerable amount of time developing a close working relationship with OMB. I'm happy to say that that is, in fact, working, and working well.

One of the things, however, that has come in parallel with this change of status is the fact that we have gained a lot of additional responsibilities and activities. As a result of that, our staff members cover substantially more ground than they have in the past. We interact on a daily basis with other units throughout the Executive Office of the President. We have spent substantial time trying to rebuild bridges to you and your colleagues in the Congress and the congressional staffs.

As you mentioned, Madam Chair, for the first time in the history of the office, we have the four Senate-confirmed associate directors in the office in the areas of life science, physical science, industrial technology, and policy and international science. Industrial technology, in particular, represents a completely new activity for this office.

In addition to that, because we have felt—the President in particular has felt—that we needed more direct private sector input into the highest levels of the administration, the President has pulled together his Council of Advisors in Science and Technology, PCAST. We have now met three times and the President has indicated that he finds this group to be an extremely useful one, one that he plans to actively work with in the future. This, I think, provides a dimension that has been missing for the last decade or more.

FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING, AND TECHNOLOGY

As you are completely aware, Madam Chair, one of our roles in OSTP is that of coordinating what goes on across the Federal agencies in matters like education and in a variety of other areas. The primary mechanism for that is the Federal Coordinating Council for Science, Engineering, and Technology. I'm very happy to be able to report to you that we have completed a restructuring and revitalization of that Council, FCCSET.

The problem in the past was simply that the participation on that Council was at much too low a level from the agencies. I'm delighted to be able to tell you that the membership now comprises Cabinet secretaries and directors of the independent agencies, so that commitments made really are carried forward.

Under FCCSET, we have put together some seven committees.

Senator **Mikulski**. How do you say that? I look at all those letters and——

Dr. **Bromley**. FCCSET.

Senator **Mikulski**. FCCSET?

Dr. **Bromley**. F-I-X-I-T.

Senator **Mikulski**. But you pronounce it FIXIT?

Dr. **Bromley**. Yes.

Senator **Mikulski**. Let's hope it does. [Laughter.]

Dr. **Bromley**. It's an unhappy acronym but——

Senator **Mikulski**. I don't know. FIXIT sounds like a good one to me.

Dr. **Bromley**. I'm stuck with it and I'm going to try and make it do these things.

Senator **Mikulski**. I'm just happy to learn how to pronounce it.

Dr. **Bromley**. Well, it's important for me just to mention to you that we have a very good example of how FCCSET works. During this past year, in the area of global change, for the first time we were able to take the programs from seven quite distinct agencies and, rather than have them come forward as seven quite different programs, the Committee on Earth Sciences under FCCSET pulled those together, massaged them, integrated them so that we had a concrete national program on global change research.

I think it was for that reason that we were able to make a compelling case to the President. So he has brought forward his request to you for the 57-percent increase in funding for that area, because it does now address the full national program. I believe that it allows us to give you some assurance that you get the maximum research and benefits for every dollar you spend, because it is a coordinated and coherent program.

I would like to do that same thing during this next year in areas like education, where Admiral Watkins is chairing the committee, which already indicates the level of support involved. Ted Sanders, the Deputy Secretary of Education, is vice chairman and Luther Williams, the chief scientist of NSF, is also a vice chairman. Other areas—biotechnology, materials science and technology, high-performance computing—and a number of others of that kind will also be considered.

BUDGET PRIORITIES IN SCIENCE AND TECHNOLOGY

On budget matters, as I said, I work closely with Dick Darman and OMB. I think the important thing to emphasize there, Madam Chair, is that we have arranged not to just interact with OMB toward the end of the budget cycle; we operate with them right from the beginning. So we interact with agency personnel and we work closely all the way through the buildup from the bottom of the total Presidential budget. That way, science and technology considerations are built in from the very beginning. I think it's helpful certainly to us in doing our job and I believe that it is also helpful to OMB.

In the system that Mr. Darman has developed for handling the budgets, we have reviews with the Director, and we have participated actively in those involving science and technology. When we finally took forward the contentious programs directly to the President, Dick Darman and I directly met with the agency Secretary or the agency head, whichever was appropriate, and the case was made—we had a chance to make our comments, pro or con—and the President then made the decision. This system worked, I believe, remarkably well.

Senator MIKULSKI. Sounds like an interesting meeting, Doctor.

Dr. BROMLEY. Oh, it was. It was indeed. One ages perceptibly.

Senator MIKULSKI. I hope we're not too dull for you.

Dr. BROMLEY. Not at all. Not at all, Madam Chair.

In doing this budgeting, we agreed that there were really three criteria that we wanted to emphasize in making the priority decisions that are reflected in the budget. The first, of course, is that we have an obligation in the administration to provide support for programs that address national needs and support national security concerns. These include those that maintain our defense posture as well as those that maintain the defense technical base.

We also want to put considerable emphasis in this coming year on this question of enabling technologies. How do we get from the basic discovery, at which we're pretty good, through the development of the technology to the point where it really can support a great many industries, a great many national security concerns?

As the President said in his March 7 speech to the American Electronics Association—and this is, I think, the most succinct statement of our present policy: "This administration is committed to working with you"—that's American industry—"in the critical, precompetitive development stage where basic discoveries are converted into generic technologies that support both our economic competitiveness and our national security."

We feel that's an important part of our role, and my Associate Director for Industrial Technology is very actively involved here.

The second guiding principle that I would mention is that we are committed to providing adequate support for basic research. In particular, we were paying close attention—and we're certainly going to have to pay close attention during this coming year—to making sure that the individual investigator, the small project sort of science, doesn't get lost in our attempts to bring forward the mega projects.

I still believe very deeply that the individual scientist and small group scientist work is the heart and backbone of our strength in American science. We have a problem there, Madam Chair.

Third, we do have this problem, that we share with you, of providing the kind of funding that will allow us to build the facilities that are investments in our national future, that are going to be there 5 and 10 years from now so that our young people who are being trained now will be able to reach the frontiers that are of greatest importance to them.

OSTP BUDGET

Now, turning to our own Office, the administration's 1991 request, as you said, Madam Chair, for $3.3 million, provides for the four confirmed associate directors, a small cadre of assistant directors—and, I would mention in passing, Madam Chair, that of the four assistant directors, three are female—and a number of senior policy analysts, with some support personnel—a total of 39 full-time staff members. This staffing assumes use of detailees only under unusual circumstances where we require them to fulfill very specific tasks that have been assigned to us.

The budget request represents a 16.7-percent increase. But of that, 4.8 percent is earmarked directly for the support of PCAST. I must say, Madam Chair, that that was based on the assumption that PCAST would meet four times a year and that we would not have panels that needed to be supported out of our budget. As it has turned out, the President has found this to be a very useful organization, and we are now looking into the question of how we can move forward a more expansive program involving this group of private sector specialists.

REPORT ON DEFENSE AND NONDEFENSE RESEARCH AND DEVELOPMENT

In addition, we have responded to requests from your committee and a number of other committees. We, for example, were asked to analyze the balance between defense and nondefense research and development, and we submitted a report on that topic to you in February. You asked us to take a look at the activities in the Department of Education and in the National Science Foundation in the areas of mathematics and science education, and we submitted the report to you in March.

I must say that, in the course of that, it was a rather fascinating endeavor, because when I called the first meeting of the senior representatives of these three groups, it turned out that only the Director of NSF and the Secretary of Education and I had ever met one another before. I'm happy to be able to tell you that, out of that first meeting, we've made some major breakthroughs. For example, for the first time, the Department of Education is now using its very excellent distribution network to distribute NSF-produced materials in mathematics and science education. That's happening right now.

Senator **Mikulski**. Would you say that again—whose network?

Dr. **Bromley**. It's the Department of Education network, which has been in place for a long time but, for reasons that totally escape me, was never made available to NSF for distribution of NSF material in science and mathematics, which was of high quality but never got anywhere.

Senator **Mikulski**. That's exactly right.

Dr. **Bromley**. So now it is actually going out through all the channels right down to the grassroots. So I'm rather pleased with that. The enthusiasm that has been developed within the Department of Education through this initiative, which you stimulated, is something I think you would be very pleased with. Because, for example, the Department of Education has petitioned to become a member of FCCSET. They've never been a member before. We have arranged that. They are actively involved in all our committees. I'm extraordinarily pleased to be able to report this to you.

PREPARED STATEMENT

Senator **Mikulski**. Doctor, we're going to have to move along. Do you have any other highlights you want to make before we can move on to our questions? This is fascinating and we could talk on.

Dr. **Bromley**. I would stop right there, Madam Chair. I've hit the high points.

[The statement follows:]

STATEMENT OF D. ALLAN BROMLEY

Madam Chair:

Thank you for giving me the opportunity to present the Administration's views on science priorities and the Administration's FY 1991 budget request for the Office of Science and Technology Policy. In doing so I will discuss how my office participates in the development of science priorities and how the Administration's proposals for the nation's science, technology, and space programs support our national goals.

As most of you are aware, The Office of Science and Technology Policy has undergone a number of changes in the Bush Administration. One important change is my appointment as Assistant to the President for Science and Technology, concurrent with my confirmation as Director of OSTP. This upgraded position for the Science Advisor reflects the increased importance of science and technology in the Bush Administration and has brought an expanded role and responsibilities for myself and the OSTP staff within the Executive Office of the President. These expanded responsibilities include my membership on the Domestic Policy Council, the Economic Policy Council, the Space Council, the Council on Competitiveness, and a close working relationship with the National Security Council and the Office of Management and Budget.

As specified by the National Science and Technology Policy, Organizations, and Priorities Act of 1976 (P.L. 94-282) that created OSTP, a major function of our office is to provide "a source of scientific and technological analysis and judgement for the President with respect to major policies, plans and programs of the federal government." My increased access and direct participation in the policy-making process within the White House has greatly increased OSTP's ability to fulfill this responsibility. I am directly involved in briefing the President on the scientific and technological components of national and international policies.

As a result of these expanded activities, OSTP staff members must cover far more ground than in the past. They interact on a daily basis with other units throughout the Executive Office of the President to ensure that considerations of science and technology are taken into account in policy deliberations. The staff has been upgraded and expanded. For the first time in OSTP's history, the President has nominated for Senate confirmation all four of the Associate Directors called for in P.L. 94-282. These four distinguished individuals will have responsibilities in physical science and engineering, life science, industrial technology, and policy and international science. As an example of the role that they will play, Dr. James Wyngaarden, OSTP's Associate Director for Life Science, heads the Biotechnology Working Group of the Council on Competitiveness chaired by the Vice-President.

My new responsibilities and the expanded and revitalized role of OSTP mean that issues of science and technology are well represented in the policy-making process of this Administration. In addition, however, the President has recently established a new, high-level advisory group of twelve distinguished scientists and engineers from the private sector that reports directly to him. This panel, PCAST, which I have the honor to Chair, will meet once a month and will establish a series of panels to focus on specific problem areas. In the first two meetings of the panel with the President, most of the major issues I will discuss today were elevated in at least a preliminary way to the President.

In addition to OSTP's roles in participating in the formulation of national policy on issues that involve science and technology, and providing access to authoritative science and technology advice, OSTP is also directed in P.L. 94-282 to review and coordinate Federal science and technology activities and to resolve science and technology policy issues that affect more than one agency. The primary mechanism for this is the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET), which I chair and that I am in the process of restructuring and revitalizing. As part of this restructuring, I intend to reorganize the FCCSET Committees so that they span the spectrum of science and technology in a more appropriate manner.

I anticipate that there will be occasions for interaction between PCAST panels and the reorganized FCCSET Committees, perhaps by holding joint meetings, so that Federal science and technology activities can take advantage of the experience of the private sector. An example of the role that I think FCCSET committees can and should play is provided by the Committee on Earth Sciences, which over the past year has developed a focused, coordinated, multi-agency program of research on global change and to which the President has responded by proposing a budget increase for FY 91 of 57 percent, to over $1 billion.

OSTP/OMB COOPERATION

On budget matters, I have worked closely with Richard Darman and OSTP and the Office of Management and Budget (OMB) staff have interacted closely in the development of science and technology budgets. Let me describe to you this developing interaction, which I believe is extremely important in the priority-setting process that goes into making up the Federal budget requests. As you know, this year this process has resulted in the President proposing a record total of $71 billion for research and development for FY 91, including a 12 percent increase in civilian R&D, which is impressive in the face of the current austere U.S. budget climate.

The entire outlook of the Bush Administration emphasizes investments in the future while -- at the same time -- maintaining commitments to the past and present. As an Administration we believe that one of the most effective ways of investing in our future is by supporting research and development in science and technology. Thus, the President has asked that there be a close co-operation between the Office of Science and Technology Policy, the Federal R&D agencies and the Office of Management and Budget in developing this

Administration's R&D budget. This should insure that the Administration's proposals to Congress have a sound science and engineering underpinning and represent the most efficient and effective allocation of funds for the support of the Federal R&D enterprise.

We are planning to ensure that the first step in this close interagency co-operation will take place in the FCCSET council working groups. Here agency program officers with the guidance and advice of both OSTP and OMB staff will help co-ordinate the individual agency R&D programs to eliminate duplication and to ensure that all important areas of R&D in specific disciplines are, in fact, supported. The National High Performance Computing program and the U.S. Global Change program are two of the best examples of how this process has the potential to work. In the coming year other areas, such as materials R&D, that are supported by almost all of the R&D agencies will be reviewed in the same manner.

Then, during the summer months when these agencies are preparing their new budget proposals for presentation to the President, both OSTP and OMB staff will be available to the agency heads and their staffs to review the focus and content of individual agency programs required to carry out the agency missions. Finally, in the fall when all of the agency budget proposals are presented to the Administration, as OMB conducts its review, OSTP will have the opportunity to jointly evaluate and prioritize the different agency programs in light of urgent national needs and Administration policy. This process was started this past fall and we in OSTP and OMB expect the process to proceed even more smoothly this coming year.

To give you some feeling for the way our two agencies interacted this past year, let me describe briefly a few of the measures we set in place for future budget discussions. Early in the year, OMB surveyed areas of R&D commonly funded by the various R&D agencies; and then OMB requested that these agencies provide us with the funding levels for each activity identified in these areas. Since this was the first year we carried out this exercise, the data we gathered is not as 'hard' as we would have liked but we expect it to be more well-defined next year. After the data collection, agency personnel met with OMB staff for 'budget hearings' on these programs. OSTP participated in these hearings, as it did in the traditional Fall OMB 'Director's Review'.

At Director's Review, R&D programs and funding levels were examined to determine an optimum allocation of funds across the R&D agency budgets. I participated in virtually all of the hearings related to science and technology. This latter determination was very tough, since nearly all of the agency budget proposals were excellent and worthy of support. Unfortunately, the available budget resources would not -- nor I suspect will they ever -- stretch to cover all of these efforts. However, several general, quite simple guiding principles were applied.

First, support is required for all programs that address national needs and national security concerns. Examples would be, the Federal

environmental clean-up effort, scientific research to address the global climate change issues, a pre-eminence in space and adequate support for the defense technology base. Implicit in this, I might add, we considered the balance of R&D funding for civilian versus defense needs.

The second guiding principle was the adequacy of support for basic research which, really, is the well-spring of all our future scientific and technological progress. In evaluating the agency programs, a concerted effort was made to ensure that 'small science' funding received the highest priority in the final individual agency programs. Finally, we examined the R&D budgets to insure that the level of funding for the scientific infrastructure and facilities in this country will maintain our scientific pre-eminence. Large facilities such as telescopes, synchrotrons, and particle accelerators are necessary for state-of-the-art research to continue. Although many may call these 'mega-projects', once built they service thousands of scientists and make possible a scientific understanding of the world and universe in which we live. They are essential for the health of our R&D enterprise.

The final step in preparing the Administration's budget is a series of meetings with the President. Dick Darman and I with the Cabinet Secretaries and other R&D agency heads sat down with the President to resolve the overall budget priorities in line with available budget resources. The very high priority the President accorded to Science and Technology is reflected in the fact that in his budget proposal to Congress, the chapters on research and development are preceded only by a chapter on increasing the national savings rate.

RECENT OSTP ACCOMPLISHMENTS

In the past year, the Office of Science and Technology Policy has been engaged in a number of activities designed to increase the contribution of science and technology to improved economic competitiveness and a strong national defense. Although many of these activities are being reorganized to reflect ongoing changes in the office, our future efforts will build on what has been done in the past.

The following descriptions touch only on some of the highlights of recent OSTP activities. A more thorough description can be found in the OSTP Budget Justification to Congress: "Summary of Accomplishments in FY 1989 by the Office of Science and Technology Policy."

In the area of international science and technology, OSTP has sought to ensure that science and technology become more integral parts of U.S. foreign relations and that science and technology issues are adequately considered in the development of foreign policy. OSTP has worked closely with the National Security Council, the State Department, and appropriate U.S. Government technical agencies, as well as the nation's scientific and engineering communities, to plan, coordinate, and follow up on state visits and summits. In addition, OSTP has sought to encourage international participation in a number of large, world-class science projects currently under development, including the Superconducting Super Collider, Space Station Freedom, and the human genome project. Finally, OSTP has helped to coordinate and has participated in a number of multilateral and bilateral efforts to improve the infrastructure for science and technology around the world and to strengthen science and technology cooperation.

OSTP is also involved in the application of science and technology to support national security. For example, OSTP participates in efforts aimed at resolving critical scientific and technical issues and helps draft position and issue papers for use by the National Security Council, the Office of Management and Budget, and other participating agencies. The Director of OSTP is also assigned the responsibility for managing the nation's telecommunications resources during wartime and non-wartime national crises and emergencies. OSTP also recently assisted the National Security Council in redefining the President's policy on U.S. export controls.

Through my membership on the Space Council, OSTP plays a major role in reviewing and developing U.S. space policy. In the past, OSTP has also worked closely with NASA and other agencies on developing policies toward the National Aerospace Plane, Space Station Freedom, and NASA's space sciences program.

In the life sciences, OSTP has begun to plan and coordinate government-wide initiatives for the Decade of the Brain, which has been established by Congress and the President to recognize the dramatic increases in knowledge about the brain and its disorders and the formidable challenges of the future. OSTP has also been engaged in activities involving biotechnology and the human genome project.

Last year, it was my pleasure to recommend to the President the awarding of 27 National Medals of Science and Technology for distinguished achievement in mathematics, science, engineering, and technology and 112 Presidential Awards for Excellence in Science and Mathematics Teaching to the nation's top science and mathematics teachers.

Finally, OSTP has been working with the Office of Presidential Personnel to identify highly qualified candidates for a range of top-level science appointments.

FEDERAL R&D BUDGET

"The budget's chief emphasis is on investment in the future," according to President Bush, and that emphasis finds strong affirmation in the Administration's support of science and technology in the President's 1991 budget. Altogether, the budget proposes a healthy increase of 7 percent in the conduct of both civilian and defense R&D by the federal government. Even more encouraging to me is the distribution of that funding. The Administration's proposals would increase civilian R&D 12 percent, from the $23.8 billion that was enacted in FY 1990 to $26.7 billion in FY 1991. Basic research would go up about 8 percent, from $11.4 billion to $12.4 billion. At a time of declining real defense expenditures, proposed defense R&D would rise by 4 percent and defense basic research would go up by 5.9 percent. As evidenced by President Bush's first budget, science and technology are going to be major and ongoing concerns of this Administration.

Altogether, the total conduct of R&D, both civilian and defense, would rise to $68.1 billion. Adding $3.1 billion for the construction, repair, and modernization of R&D facilities brings the total proposed federal support for R&D to $71.2 billion.
This amount is 5.1 percent of the total budget for FY 1991 and 1.3 percent of the U.S. gross national product. In FY 1990, the corresponding percentages were 5.0 percent of the total budget and 1.2 percent of GNP.

This year's budget proposals have the effect of changing the proportions of civilian and defense R&D funded by the federal government. During the 1980s, defense R&D rose much faster than civilian R&D, reaching a peak of 69 percent defense and 31 percent civilian in 1986. Since 1986, the ratio of civilian R&D to defense R&D has been growing steadily, and in FY 1991 civilian R&D is projected to be 39 percent of the total conduct of federal R&D.

PRIORITIES

The Office of Science and Technology Policy is charged with reviewing and coordinating federal R&D that cuts across the missions of more than one federal agency and with providing advice to the President on issues of science and technology policy that affect national and international policy. In light of these responsibilities, OSTP has defined several areas that will receive major emphasis in the coming year.

Basic Research

Basic research provides a continuing flow of fundamental new knowledge, and federal support for basic research is an essential investment in the nation's scientific and technological future. Our country is unique in the extent to which our universities both conduct the research that expands the base of fundamental scientific knowledge and simultaneously prepare future generations of scientists and engineers to use that knowledge in an innovative and creative fashion.

This university-based, individual-investigator and small group research still constitutes the heart of our science and technology enterprise. Funding for this research must be protected to maintain the diversity and vitality of American science and technology.

A significant problem has arisen, particularly in the National Institutes of Health and the National Science Foundation, where the fraction of excellent, peer-reviewed, new proposals from young investigators just beginning their academic careers has fallen significantly, dropping to below 30 percent for the first time in the postwar period. The discouragement caused by a lack of funding is particularly unfortunate at a time when the nation has a very serious need to recruit more young people into such careers.

The problem results, in substantial measure, from the fact that agencies such as NIH and NSF have responded in the past to urgent and reasonable recommendations that grants be made on a multiyear basis and that individual grants be increased to reflect the rising costs of doing research. The corresponding "outyear mortgages" now limit the number of new proposals that can be approved. A contributing factor is the demographic fact that the number of young scientists competing for such support continues to grow at a rate exceeding that of the available resources.

The federal government also supports basic research through construction of the large, expensive research facilities that are essential to progress in areas ranging from space sciences to particle physics to materials engineering. Large facilities are important not only for academic research but also for industry-oriented research. OSTP will work to ensure that a balance is maintained between the demands of these large facilities and those of individual investigators.

Science and Technology for Economic Growth

Our ability as a nation to commercialize scientific and technological innovations effectively is a major factor in assuring our long-term economic growth, industrial competitiveness, and national security. The United States spends more on research and development than does any other country in the world. We must continually assess the role of government and industry in the technology commercialization process to ensure that we realize the full potential of this public and private investment. Indeed, defining new relationships between the public and private sectors to achieve this goal will be a major challenge of the 1990s.

A prerequisite for our future national well-being is a strong manufacturing sector. Our national policy toward technology has the primary underlying objective of encouraging this manufacturing base--particularly in the high technology end. In addition, the nation needs a better working relationship between government and industry and an improved climate for the formation of private sector R&D consortia. The sophistication and capital-intensive nature of modern technology require new ways of increasing cooperation between government and industry and of fostering communication on long-term technology goals.

OSTP plans to focus attention on several broad areas of advanced technology, including information technology, biotechnology, and materials science and engineering. Such "enabling" technologies, have application in a broad range of commercial sectors; however, no single company may be able to capture sufficient return to justify the required investment to develop the technology independently.

Advanced technologies cover the spectrum from basic research to engineering development in a broad range of fields. For purposes of illustration, the areas of information technology and materials science and engineering will be highlighted.

Information technology covers all aspects of computing, computer networks, and computer-aided design, engineering, and manufacturing. High-performance computing, while still a relatively small component of the overall industry, holds particular promise as a high-leverage technology that could expand dramatically in the future. A national computing network, ultimately linking research institutions, businesses, schools, and homes, will have very strong leverage on the rest of our economy.

Materials include the basic components of our industrial civilization, from ceramics, semiconductors, superconductors, and metals to polymers and composites. Important new insights into the nature of materials and new abilities to create materials, in some cases on an atom-by-atom basis, are ushering in an age of "tailored" materials that will have a wealth of everyday applications. OSTP intends to raise the visibility of this critical area of R&D.

Specific concerns in the area of science and technology policy and its implementation on which OSTP has and will continue to focus are:

- Refining our technology policy to establish guidelines for future federal R&D investments.

- Catalyzing state and local activities in industrial competitiveness to obtain maximum leverage for Federal funds.

- Fostering an effective three-way partnership involving industry, academia, and government.

- Improving the technology transfer process from Federal laboratories to the private sector.

- Encouraging the development and application by the private sector of critical technologies that exert strong leverage on the U.S. manufacturing sector and other sectors of the U.S. economy.

- Working to ensure an adequate flow of well-trained professionals in mathematics, engineering, and science.

Science and Technology for National Security

America's scientific and technological strength provides the qualitative edge that has long ensured our security and that of our allies. OSTP will continue to interact closely with the Department of Defense in providing advice to further advances in defense technology.

Particularly in times of international uncertainty and change, as noted above, a strong research and technology base is critical to promote investigation into promising new technologies and to guard against technological surprise from potential adversaries. OSTP is keenly interested in ensuring healthy levels of investment in critical and cutting-edge technologies central to tomorrow's defense.

Many of these technologies also have commercial applications. For example, they are integral to the development of the National Aerospace Plane, an aircraft designed to take off and land on a normal runway and fly through the atmosphere and into orbit at hypersonic speeds. The NASP program has also contributed to these technologies, generating important advances in composite materials and fluid dynamics.

The dramatic changes under way in Eastern Europe presage changes in the international environment and in the security needs of the West. The development and application of technology to support changing defense and foreign policy requirements in such areas as arms control verification technologies, intelligence collection, analysis and protection, and command, control, and communication capabilities are key OSTP concerns.

Life Sciences

The life sciences have made enormous progress during the last decade, yet they still represent a frontier with major advances already on the horizon that will dramatically enhance our quality of life. While research into diseases such as AIDS captures much attention, many other areas of investigation will also have a sweeping impact on our population: e.g., efforts to understand and ameliorate the effects of aging.

President Bush has designated the 1990s as the Decade of the Brain to focus needed public and scientific attention on the multidisciplinary efforts required to continue our progress in understanding mental illness, addictive disorders, and treatments for diseases that affect the brain. OSTP will be coordinating the activities of the individual federal agencies responding to this new initiative.

Global Change

Global change is one of several issues that highlight the increasingly interdisciplinary nature of science. At the federal level, this interconnectedness calls for an increasing number of R&D programs that involve different agencies and scientific specialties. The degree of success of the global change R&D program in predicting atmospheric temperatures, for example, will depend on effective communication between these specialties.

As our depth of knowledge increases, effective communication among scientists in different disciplines becomes ever more critical. OSTP will continue to play an important role in facilitating the necessary cross-fertilization among scientific communities.

The global change area is one where the effectiveness of the FCCSET mechanism has been demonstrated in striking fashion by the activities of FCCSET's Committee on Earth Sciences. This Committee has carefully coordinated and integrated the activities of eight federal agencies into a national research plan aimed at greatly improved understanding of the phenomena underlying global change.

Because global change is truly an international matter demanding international resolution, and because the President has made it clear that in this area--as in all others -- U.S. national policy must be based on sound science and sound economics, the President hosted an international White House Conference here in Washington on April 17-18 of this year that brought together the three senior government officials in science, economics, and the environment of each of the participating countries. The goals of the conference included sensitizing these three communities to each other's activities, focusing on the gaps and uncertainties in current scientific and economic understanding, improving the analytic tools and data required to address problems of global change, and developing at least an initial framework for international research that draws on the resources, expertise, and data of all of the participating countries (a framework that would parallel, in some sense, the national plan developed by the Committee on Earth Sciences).

International Science and Technology

The results of basic research have always been a global resource adding to the knowledge base and ultimately to the economic prosperity of all nations. While the social rate of return on investment in basic research is very high, benefits do not accrue only to sponsoring countries or governments but rather to the world at large. This being the case, where possible, nations need to coordinate planning and support for basic research, as in the above example of global change. Coordination is especially needed for projects that require extraordinary financial commitments, such as the Superconducting Super Collider, Space Station Freedom, and mapping of the human genome, and that involve science and engineering talent from many nations.

OSTP is developing a framework for dealing effectively and comprehensively with the challenges of coordinating science and technology on a global scale. This comprehensive approach will be addressed within the FCCSET structure. Existing bilateral science and technology relations with countries and regions such as Japan and the

European Community will play an important role in this effort, as will emerging cooperation with the Soviet Union, Eastern Europe, and developing countries.

Science, Mathematics, and Engineering Education

Education at all levels needs to be revitalized. This revitalization involves not only the training of our scientists, engineers, and technical workforce but also the education of a population sufficiently literate in science and technology to deal with the social issues arising from rapid scientific and technical change.

Achieving such a goal will require a broad-based approach involving businesses, academia, educational organizations, and State and local governments. For example, businesses are playing an increasingly important role in the training and retraining of our workforce. Junior colleges and technical schools provide a means of upgrading the skills of our youth and workforce. And last but not least, the precollege level is where life-long interests in science and mathematics are aroused, if they are to be aroused at all.

Through FCCSET, OSTP is developing a framework for interagency coordination and collaboration for mathematics, science, engineering, and technology education. The goal will be to develop an effective and appropriate role for the Federal government in support of the states, localities, and universities as they reform science and technology education. In order for this new FCCSET committee to be effective, it will be necessary that the Department of Education (DOEd) become a member of the FCCSET Council. OSTP is currently working with DOEd and the Executive Office to develop the appropriate means to achieve this end.

Conclusions

Though the Administration's FY 1991 science and technology budget covers a wide range of R&D activities, several underlying themes unify the Administration's science and technology policy:

- The first is to preserve the initiative, independence, and creativity of American scientists through a stable multiyear pattern of funding for basic research and continued real growth in federal R&D funding.

- The second is to foster a more efficient and effective coupling between R&D and commercialization efforts.

- The third is to ensure that the best scientific advice is an integral part of all policy decisions on the environment.

- The fourth is to contribute to international cooperation through international support of large science projects such as the

Superconducting Supercollider and the Space Station, along with international cooperation on a wide range of other scientific endeavors.

- Finally, a key goal is to improve national literacy in science and mathematics and meet future requirements for trained people in science and engineering. This is essential for our future economic prosperity in an increasingly technological and competitive world.

OSTP BUDGET SUMMARY

The total FY 1991 budget request of $3,300,000 for the Office of Science and Technology Policy (OSTP) will support an estimated 39 professional staff and support members.

The FY 1991 request provides for four confirmed Associate Directors -- the full number authorized in the 1976 enabling legislation. The four areas of responsibilities are: policy and international science and technology; industrial technology; life science; and physical and engineering sciences. In addition the FY 1991 request will provide for a small cadre of Assistant Directors and Senior Policy Analysts to assist the Associate Directors. The professional staff will be generalists, rather than specialists. This is essential, given the number of issues addressed by OSTP, and the changes in emphasis from year to year. This staffing assumes use of detailees only under unusual circumstances where no other alternative is available.

The FY 1991 request includes $135,000 for support of the President's Council of Advisors on Science and Technology (PCAST): $60,000 for the salary of the Executive Director, $15,000 for printing costs for reports generated by PCAST; and $60,000 for travel and subsistence for members of PCAST. The PCAST will be a very active group, with monthly plenary meetings, and an extensive subcommittee, panel and working group substructure. This will entail significantly increased costs from previous years.

The Budget request for FY 1991 is 16.7-percent, or $471,000, above that currently appropriated for FY 1990. However, 4.8-percent of the increase, or $135,000, is in support of the President's Council of Advisors for Science and Technology. The request provides a base of support which will allow OSTP to fulfill its increased responsibilities for coordination of the R&D policy of the Administration. This essential level of coordination is highly labor intensive, and should not be delegated outside the Executive Office. Let me summarize the existing responsibilities of OSTP described above:

- Direction of the Federal Coordinating Council for Science, Engineering and Technology (FCCSET). This requires an intensive level of participation, coordination, and guidance by OSTP staff in the numerous working groups of the various FCCSET committees.

- Interagency coordination, under FCCSET, of science and technology issues to be incorporated in negotiated agreements with foreign countries.

- Recommendations to the President on current major issues of science and technology policy; direction of, and participation in, interagency coordination of such issues, as appropriate. These activities require a high level of participation and interaction by OSTP in the numerous coordinating groups within the Executive Office of the President.

- Anticipation of new science and technology issues, or other issues with a significant science and technology component; advice to the President and initiation of interagency coordination on such issues, including technical findings or other actions, as appropriate.

- Coordination of the President's Council of Advisers on Science and Technology findings with interagency findings in appropriate areas of concern to the President and his advisors.

- Coordination with the Office of Management and Budget of the Administration's Budget request to Congress for science and technology.

- Preparation of reports, in accordance with legislative direction, including for 1990:

  A. Analysis of the balance between Defense and Non-Defense Research and Development (Submitted February 1990);

  B. Report detailing the steps that the Department of Education and the National Science Foundation are taking to cooperate more readily on improving the coordination of math, science and engineering education (Submitted March 1990); and

  C. Report describing OSTP views on the principal scientific questions in global change research, that are in greatest need of attention by the Congress; and how the existing Interagency Committee on Earth Sciences research strategy plans to answer these questions (To be submitted May 1990).

Given the high workload expected for FY 1991 and beyond, the requested level of support is fully in keeping with current budgetary constraints. In view of the significant leverage that can be exerted by coordination of science and technology policy within the Executive Office

on the overall coherence and effectiveness of the research and development conducted within this nation. I believe that this is one of the most cost-effective program that Congress can support.

That concludes my remarks. I would be happy to answer any questions the Committee might have on either the Administration's Science and Technology Budget Proposal or the OSTP budget request.

STAFF LEVELS AND ACTIVITIES

Senator MIKULSKI. Well, you certainly have. Obviously this office to the President is operating in a more visible, highly assertive way than before, and doing an extraordinary job coordinating in a variety of difficult areas.

We were most pleased to see you at the President's meeting when we had the space summit the other day, which I thought was very informative.

Dr. BROMLEY. Thank you.

Senator MIKULSKI. You talked a little bit about the 16-percent increase, which, for this year is a substantial increase.

Dr. BROMLEY. Yes, indeed.

Senator MIKULSKI. Could you repeat and tell us where are the areas that this increase will be spent on?

Dr. BROMLEY. What we will be doing specifically with this increase is to provide a little additional level of support for the four associate directors. At the moment, we've simply got too many chiefs and not anywhere enough of other folk in the office. Our efficiency will go up enormously if we can, in fact, provide—not too much—we are authorized to go up to 39 full-time persons. That is as far as we want to go. We don't see ourselves ever getting bigger because, as Senator Garn has indicated, there's a great tendency to lose efficiency when this happens. We don't want to do that.

But we certainly need to be able to pick up some additional support personnel. We need to be able to pick up some additional equipment. We need to be able to specifically take care of the needs of our private sector panel, PCAST, in a more effective way than we can at the moment.

Senator MIKULSKI. How much more will PCAST cost us?

Dr. BROMLEY. That's a question that we are looking into at the moment in detail, Madam Chair. I would not want to give you a precise figure today for the simple reason that the change that is happening right at this moment reflects the President's desire to have more interaction with this group than we had planned when we made our budget.

So I would like, with your permission, to have my staff work with you to go over the numbers.

Senator MIKULSKI. We would. We want the President to be able to have the advice that this group will be able to give him, in fact very needed advice. So we will work with you on that.

Dr. BROMLEY. Thank you.

PRIORITIZING RESEARCH NEEDS

Senator **Mikulski**. Let's go on to the job where, I think, it is important for you and advice to the President, is in making hard choices in what Dr. Press, the president of the Academy of Science has called, the Golden Age of Science.

He gave a speech 2 years ago that argued for the need to prioritize among those research projects contained in the Federal budget. That, thanks to the ingenuity of the free world and the interaction of entrepreneurs, there is no limit to good ideas that are worthy of funding.

Dr. **Bromley**. Right.

Senator **Mikulski**. But they need to be prioritized. Could you tell us what you're doing differently from your predecessors in giving a sense of priorities among the science projects proposed in the fiscal year 1991 budget, and then how this would be a useful tool for both the executive and legislative branchs to target our dollars in a way that is most beneficial to our national interest?

Dr. **Bromley**. It's a remarkably fundamental question, Madam Chair, and I think that we have in fact, in this past year, established a new mechanism that makes it very explicit how those priority decisions are made.

We are the only developed nation in the entire planet that does our science planning from the bottom up. So all of the large projects that come forward, come forward with a large constituency already in place. They make the best case they can. They convince an agency to include these things in their budgets.

Our function in OSTP is to make sure that, in the discussions with OMB, we get the best science and the best technology, that we really understand how feasible, how ripe, how ready for exploitation each of these is. We try to get some feeling for what the impact of these projects will be, not only on science but on American society. But, in the last analysis, for large projects of this kind, in our present system of budgeting, what happens is that these are taken forward with the pros and cons and are presented specifically to the President by Mr. Darman, myself, and the agency heads involved. It is the President who finally calls the shots on these large projects.

We believe that, in our kind of Government, from the administration end of the street, this is the way it should be. So it is a very specific, ordered process that marshals the arguments, the facts, and presents them finally, with our recommendations, to the President.

Senator **Mikulski**. Once—obviously this is a process that has been assembled under Mr. Darman and yourself.

Dr. **Bromley**. It has.

Senator **Mikulski**. It is, I think, very useful. Once that's sent to the Hill, how do you see the projects being prioritized?

Over in the Budget Committee, there's function 250. But then when you get over to us, we have a substantial amount of the R&D budget. The Department of Energy, Senator Bennett Johnson's subcommittee does. Then we've got FDA, biotech thing over there with Ag.

Dr. **Bromley**. Right.

Senator **Mikulski**. Harkin has NIH. As you know, we function in a linear way, though there is a lot more collegiality now. But still, how would you recommend, or someone that—see, it's what we said to the President at the space meeting.

He recommended the National Science Foundation's budget substantial increase, NASA, substantial increase, supported, I think, in the subcommittee. But then this has a rather unique 302(b) set of agencies—very unique.

SUSTAINABLE SUPPORT FOR RESEARCH

Dr. **Bromley**. I would turn, Madam Chair, precisely to the discussion at that meeting, because I think that a number of very important points were made there. You yourself raised the point that we have to, in this country, figure out a sustainable source of support for the kind of large projects we're talking about here.

I think also the point that a number of your colleagues made in that meeting, to the effect that it is extraordinarily difficult, I recognize, for you and your colleagues, in your subcommittee, for example, to have to make decisions between Veterans Affairs, Housing and Urban Development, NSF, and NASA.

If there is some way that we could perhaps stand back and take a more global look. But that's not in my job description at all. But it is a challenge for all of us, to get a broader look. The thing that I think finally is involved here is that, given the way our system functions, if the people who want these major projects really want them bad enough, first of all, they have to convince us in the administration that they should be included in the budget.

But that's not enough. They have to get busy and work to convince you and your colleagues that, in fact, what they want done should take priority over the tremendous range of demands that you have to face. I think that it's a role that the scientific and technical community is going to have to play much more than it has in the past, in actually working with the Congress, to explain, to help, to identify, and to support.

Senator **Mikulski**. Well, I would hope that there is a followup to the space summit that we had.

Dr. **Bromley**. Yes.

Senator **Mikulski**. The discussion on identification of sustainable revenue. There was even conversation with the President, and among ourselves, on even reorganizing the committee or the subcommittee structures.

Of course, in the absence of the executive branch, there is no department of science as there is a Department of Education and Department of Veterans Affairs and so on. The closest thing we come to it, I believe, is in the Budget Committee on function 250.

Am I right, Senator Garn?

Senator **Garn**. Yes.

Senator **Mikulski**. You're really more of an expert and experienced in this.

Senator **Garn**. They've already cut $1.2 billion yesterday out of function 250.

Senator **Mikulski**. Well, that's what you were talking about. But when function 250 functions, it is not allocated to us. I would hope that, No. 1, you would really continue your conversations with the President and Mr. Darman.

So let's follow up. Because I think, as we get into the space funding issues, we will then also—these other concerns that we have, I think, will emerge. It will call, not only for identification of sustainable revenue, but I think there needs to be a rethinking of the way—not only the way we work together but the way we work. I think we'll learn a lot from it.

I am very open to this issue.

Dr. **Bromley**. We will certainly look forward to working with you, Madam Chair, on this. I would only emphasize that—and Senator Garn doesn't need this emphasis—but we have, if that large a reduction takes place in function 250, a very serious problem facing us, particularly in terms of what happens to young people just beginning their careers. The fraction of their proposals and their desires that we can handle, even under the President's budget, is at the lowest point it's been since the war years.

With substantial cutting, I think we have a very difficult problem to keep that at a viable level, because this comes at a most unfortunate time. It's just at a time when we're trying to convince more young people to take up careers in academia, to take up teaching careers, take up careers in research. We're discouraging a lot of them.

So this is something that we will really have to devote great attention to, and I think we have to work together to make the best of this, however that does end up.

Senator **Mikulski**. I think this is a good point—my own time has expired—to turn to Senator Garn to follow up.

Senator, you're also—are you a member of the Budget Committee?

Senator **Garn**. No; fortunately. I've got enough problems.

Senator **Mikulski**. Why don't we pursue whatever line of questions the Senator has. As we lead into Senator Garn's questions, the budget functions and the subcommittee on appropriation are not parallel. We take NASA. Part of NASA is in function 400 on transportation, because of their aeronautical activity. But when it comes here, we're the one-stop shop and so on. We don't want science to be based on who lobbies the Hill the most.

Dr. **Bromley**. No; if science isn't excellent, it's not worth doing.

Senator **Mikulski**. The loudest or the squeakiest wheel would get the microchips or such as that.

Senator Garn?

COORDINATION OF SCIENCE POLICY

Senator **Garn**. Thank you, Madam Chair.

To follow up my discussion with Mr. Deland, there isn't a comparable structure out there, so I'm not ready to get rid of you yet. But I would like to make you Secretary of Space, Science, and Technology. Because I do not favor making EPA a Cabinet level office unless they consolidate the programs we're talking about.

Senator Mikulski and I were talking about what EPA has become. I would want to consolidate the environmental activities. Then it makes sense to elevate that to Cabinet Secretary. It's a political decision to just say EPA goes from being a Director to a Cabinet officer. Then it makes it sound like we're for the environment.

Veterans is also that kind of decision. They did rather well without having a separate Cabinet head. That one, to me, is a retired military officer and a veteran is ridiculous to have elevated that—another political decision.

But, when I look at the future and the technological base of this country, what really makes sense is to coordinate and consolidate science activities—because they're all fractured too—and have a Secretary of Space, Science, and Technology. That's the future. That's what we were talking about in that meeting. Mr. Darman said, you've got past voters and present voters and not very many future voters. That's one Cabinet level office or officer I could really support.

These numbers from the Budget Committee don't recognize the future at all. Talking about $1.2 billion in budget authority, 1991-92, $3.5 billion in function 250, and $2.3 billion in outlays in fiscal year 1992. If you had a sequester, you'd lose $2 billion in budget authority, which would require redesign of the space station. We simply couldn't even build it. It's already been redesigned.

The space shuttle, you'd cut flights from 10 to 6. The National Science Foundation wouldn't even begin to reach their goal of doubling their grants and so on. So, although I was pleased with the meeting too, the cuts go on. This has been a battle that I've fought for many, many years.

So I really think what the Chairman said the other day was important. It's too late for this year. We've got to fight the 302(b)'s. But we must persist in finding some sustainable source. That's why I wanted to point that out in that meeting—both what Senator Heflin and Senator Mikulski said. I just wanted to make sure everybody understood that. Because although I said it, I'm not sure it sunk in.

Because I, for one, am tired of fighting this science battle year after year after year, and picking up the crumbs of what is left over. A lot of people accuse me of just being interested in the shuttle and the space station and that. My interest is far broader than that to the whole spectrum of science.

Dr. **Bromley**. I know that.

MATHEMATICS AND SCIENCE EDUCATION

Senator **Garn**. Math and science teachers—I went back to school one night with one of my high school kids. The teacher apologized to me because she said, "Senator you might"—if she'd been quiet, I wouldn't have known but she said:

> I want to apologize. I'm not a chemistry major. I'm unfortunately just reading two chapters ahead of the students and I apologize to you for that. I hope your son isn't too upset.

Well, my son, anything he can get away with is fine with him. More than anything else that I deal with, I am concerned about the whole science and technological base of this country, where we are going to be in relationship to the Soviet Union, to—you say West Germany—now United Germany, Japan. We're not training enough engineers and scientists and our students aren't taking fundamentals.

Even though I have a degree in banking and finance, my interest was so much in science that you needed 190 hours to get a bachelor's degree; I had 245 hours. It took me a long time to get a 4-year degree because I took physics and chemistry and calculus and trig and you name it, just because I wanted to know.

I think it's so unfortunate the way our school systems have developed. Because I don't remember my calculus anymore. It's been far too many years. But I'm still convinced that my mind is better trained and, I think, more analytically because of having those classes, even though I don't use them and don't remember them anymore.

Dr. **Bromley**. I agree completely.

Senator **Garn**. So I really am very frightened about what's happening. I'm not sure I know what to do about it. I certainly share your concern in defining the success ratio in young scientists, trying to get grants. That's certainly true in the case of the National Science Foundation and research grants at NIH across the board.

So we're getting a much greater pool of scientists and engineers that are seeking Federal grants, while the grants are going down. I'm completely on your side on that issue. Yet there are some that would interpret your statistics as saying, well, all you're doing is creating more academic scientists out there and researchers and there's too many of them. I'm sure you've heard that argument.

Dr. **Bromley**. Oh, yes.

Senator **Garn**. That we're spawning more useless research out there. How would you respond to that? I'm on your side on the issue.

TRAINING OF SCIENTISTS AND ENGINEERS

Dr. **Bromley**. Well, I would—let me take the specific example of engineering, Senator, because that's one where there is a direct tie with our competitiveness and security.

Twenty percent of all the faculty positions in engineering departments in the United States are now vacant; that's the first number. In order to fill the 80 percent that are filled, we've had to go outside the United States for a very large fraction of these people. In a number of those cases, the people who are now occupying engineering faculty positions in this country have come from cultures that, first of all, give theory much higher weight than anything practical. So American education and engineering is becoming increasingly theoretical.

As I said in a meeting yesterday, a theoretical bridge isn't worth a damn to anybody. Second, the same cultures don't believe that women have any business being in engineering, and we don't need any more barriers than we already have to keep women out of these professions. So there's a situation where we desperately need to keep young Americans in those faculty positions. Otherwise, we're not going to have the flow of trained young people that we need to keep this country ahead.

Senator **Mikulski**. With our values.

Dr. **Bromley**. With our values.

Senator **Mikulski**. Our pragmatic world view.

Dr. **Bromley**. Our approach, the know-how, the edge that we've had, that has kept us competitive thus far, that's given us our leadership. I feel very strongly about this. Here's just a single example—it's true in many other fields—where we have sort of let the system get away from us. It starts right back in the elementary schools and goes up, as you said, through the high schools, where less than 50 percent of the people teaching mathematics and science in this country have any training in mathematics and science. That's scandalous.

It's perpetrating a fraud on a lot of our children. So I wish I knew—and could come to you, sir—with a clear recommendation. But what I will tell you is that, by this time next year, we will know from this FCCSET activity what is being spent by the Federal Government across the board on education. I doubt that anyone can give you that number at the moment, because we're going to pick it out of all the agencies who are members of this group. Then we'll know what we've got to play with.

I'm willing to bet that we can expend it more effectively and efficiently than we're doing right now. I got a very interesting statistic the other day from Secretary Cavazos; that we are spending $353 billion a year on education, just at the State and local level, to say nothing about the Federal level.

We must be able to do vastly better than we're doing now, at all levels.

Senator **Garn**. Well, I agree. Any information you can supply us—because primarily what we get engaged in here is more frustrating to me every year. It's not substantive discussion of the issues like we're having now. The chairman and I have to get involved in the 302(b)'s and number crunching and games.

We totally lose sight, not because we want to, but the process is forcing it. You have these feelings and you don't really know what to do about it. So any specific information you can find that lays the case for what we all know to be the case, in my own State. Utah spends more of its total income on education than any other State in this country. We spend less per student because we have a lot of kids.

But the quality of education—I hate to be one of those who looks back and says, hey, it's been 40 years— almost 40 years since I graduated from high school. How come with all this money, my kids aren't learning what I did 40 years ago. Not as much is being required of them. So where is the net result from all this expenditure of money.

So that would be very, very helpful to us. I also had a Japanese delegation in to see me a few weeks ago. I lived in Japan when I was a young naval aviator. They were trying to be so polite. The leader of the delegation said:

"Now, Senator, I do not want to offend you," but he said—I said: "Well, just go ahead; spit it out. You can't offend a politician. We're dumped on all the time."

He said, "Do you know why, one of the reason we have such a big trade deficit?"

I said, "Well, I think I know most of the reasons. What's yours?"

He said, "Well, in our country we train engineers and scientists. In your country you train attorneys."

He was being very serious. He wasn't trying to be funny at all. But it makes the point of what we're talking about.

Dr. **Bromley**. Unfortunately, he was right, too.

Senator **Garn**. He went on to say that, "Do you know that 80 percent of the world's attorneys are in the United States, and there are more attorneys in the Washington, DC, area than all of Japan combined?"

Senator **Mikulski**. And psychiatrists. [Laughter.]

That's my feeling. Well, I don't have a therapeutic personality but I do watch those that do.

Senator **Garn**. But, anyway, I'm pleading for some help—some substantive, factual help that we can start to get a handle on some of these things and, with limited resources, try to spend it better so that we don't lose that technological——

Dr. **Bromley**. Let me say, Senator, that certainly within our limitations of staff and resources we will respond and will try and get you this kind of information. This question of education in mathematics and science we view as the most critical area of all of our activity, because it underlies everything else we do. If we fail there, all the rest that we are trying to do will crumble.

BIG SCIENCE AND LITTLE SCIENCE

Senator **Garn**. Let me ask you one more question before my time is up. The argument over big versus little science—and I'm sure you're familiar with that—the big science crowding out the little science. How do you view that debate?

Dr. **Bromley**. It's a very serious problem, and it's one that we're going to have to work together—both ends of the defense area. The problem is, in part—there are many reasons, and there's blame enough to go all around.

It's in part the result of the agencies responding to perfectly reasonable requests from the scientific and engineering communities over recent years. People pointed out—when Dave Packard and I did a study of the health of U.S. universities and colleges back in 1986, we found out that in the best schools here in the Nation, young assistant professors were spending fully one-third of their time writing proposals or writing documents to tell somebody what they had allegedly done with the last proposal. That's a terrible wastage of young brainpower at its most creative time.

So a lot of us argued that you've got to make the grants of longer duration, so they don't have to spend so much time doing this kind of unproductive work. NSF and NIH both responded; the grants became longer. Then it became clear that with each year the frontier's more difficult to reach and costs more. So we said, you should raise the amount of grants and contracts. The agencies responded; they did that.

What we built was an out-year mortgage that is catching up with us and is making it difficult for us to respond now the way we'd like to. On top of that, we have just straight demographics. There are more young scientists now applying than ever before in history. There's a peculiar demographic feature. Fully 87 percent of all the scientists and engineers who ever lived and worked in the United States are alive and working today, whereas less than 4 percent of the citizenry are alive and paying taxes today. Those numbers sort of highlight one of the problems we have.

But it is demonstrably difficult—and each year in the President's budget what we are giving you is our best balance between investing now in what the young scientists in the country want to do, and building the facilities that they're going to need in 5 or 10 years to take them to the front of their field—investing in the future. That balance is extremely difficult, and the bottom line, Senator, as far as I'm concerned, is that we are not, as a nation, investing enough in research and development, in science and technology at this time, despite the generous support that you and your colleagues have provided.

I don't believe that we're investing enough in terms of what our competitors are doing, in terms of the opportunities, in terms of what I think the returns will be to the whole society.

Senator GARN. Thank you.

Senator MIKULSKI. Senator Grassley?

Senator GARN. He left.

Senator MIKULSKI. I'm sorry. I didn't see him.

SCIENCE EDUCATION STRATEGY

Mr. CHAIR—MR. former Chairman, before you go, I think you raised an interesting point on the science education issue. You know my commitment.

This then takes me to a request. First, this document that you gave us on global change is a document we're using as we go through the appropriations. Essentially, the document that you gave the world, because it's free. Anybody can come in, read it, and so on.

Everybody's been having meetings about global change and global warming. But here is a blueprint for what we should be doing. We had that hearing and so on.

This then takes me—and what was so useful is, you've got all the agencies in the room, identified the things that they needed to do on this topic. Then what we're now doing in the subcommittee is looking at what is appropriate for us, et cetera, et cetera.

This then takes me to, could you give us a science education strategy document with the 1992 budget, just as you've done with global warming for the 1991 budget? We could then look at this—and I can assure you as a member of Senator Kennedy's Education Committee, we would use it.

Dr. BROMLEY. I can promise you that, Madam Chair, because we already have the structure in place, with the charter telling them that that's what their job is between now and the 1992 budget. That's the group that Admiral Watkins will chair.

I have, in my own office, a very distinguished high school math teacher, because I felt I needed somebody who could really advise us on the real problems down in the trenches.

Senator MIKULSKI. Is that Mary Harley Kruter?

OTA BOOK, "GRADE SCHOOL TO GRAD SCHOOL"

Dr. **Bromley**. That's right, and we're giving this very high priority. It is my hope—and I'm quite confident we can do it—that we'll have the corresponding booklet to you in education, and in a variety of other fields, by this time next year—actually before this.

Senator **Mikulski**. What I've been operating off of is the OTA book, "Grade School to Grad School."

Dr. **Bromley**. It's a good book.

Senator **Mikulski**. Again, how we can increase our efficiency and productivity? Education is a function of State and local government. We had a mayor, a city council member that was here.

However, you know, that National Science Foundation material that you said is getting out, it's been Science Technology Week. They did beautiful posters and so on. I took a bundle and I've been giving them out.

I've asked teachers if they've gotten them, in Baltimore County—not even Baltimore city, which is a pretty good school system. The answer was no. So I've asked them to go up their pipeline. Because what's happening is we pull together advisory groups, all those things that they develop—excellent material—and then it's sitting somewhere.

So that's just one area. We don't want to hold hearings here on what is the distribution system of the National Science Foundation material. But somebody's got to start asking those questions.

We really do need a book on science/math education.

COORDINATION ROLE

Dr. **Bromley**. One of the foremost goals of my office for my duration in it is to be able to produce for you that kind of document in field after field. I view that as our primary function, apart from advising the President, this is part of it, to coordinate what happens across the Federal Government so that we can look at the U.S. programs in something, rather than DOE programs, NSF programs, somebody else's programs, and put it all together.

We can be much more efficient in using the funding that you can make available to us if we do that.

Senator **Mikulski**. Well, thank you.

There are many questions that we could go into on global climate and superconducting and biotechnology. We'll save those for another day.

We've talked a lot, I know in this committee, on things like the climate change, Senator Garn's interest in supercomputing as well as my own. We would also really encourage you to be—I know you're with Dr. Wyngaarden, Life Sciences, on the biotechnology coordination, which we feel is important in competitiveness to some of our more hardware—easily identified techno stuff.

-I'm afraid when we get into things like EC 92—you know, they took our money for NATO. But I don't want us to then say, thank you. You know, we don't need a superpower and we certainly don't need a supertrading power. I think we do and I know you do too.

Dr. **Bromley**. I do too.

Senator **Mikulski**. So we look forward to more conversations with you. Thank you very much.

Dr. **Bromley**. I do, too, Madam Chair, and I certainly look forward to your help. Working together, I think we can make things happen here.

ADDITIONAL COMMITTEE QUESTIONS

Senator **Mikulski**. We will be submitting the balance of the questions for your response in the record.

[The following questions were not asked at the hearing, but were submitted to the Office for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR MIKULSKI

NEW SCIENCE ADVISOR

SENATOR MIKULSKI: Although the President has said that he will elevate the position of Science Advisor, he has not proposed any enhancements to the Reagan budget for the Office of Science and Technology Policy. How will the Science Advisor be able to perform an enhance role without additional funds?

ANSWER: The FY 1990 budget request of $2,027,000 represents an increase when compared with the FY 1989 level of $1,587,000 and the FY 1988 level of $1,887,000. The FY 1990 level, while austere, will permit staffing to return to nearly the level of FY 1988. OSTP intends to accomplish an enhanced role in the science and technology policy process with our selected staff of exceptionally high quality. An enhanced role is not necessarily equivalent to more money or manpower.

GLOBAL WARMING

SENATOR MIKULSKI: President Bush has said that fostering international cooperation on the Global Environment is one of his special areas of concern. How does the budget request reflect this?

ANSWER: The budget makes no special provision to budget for fostering international cooperation except for the increased funding for the U.S. Global Change Research Program.

The objective of that program is: "To Establish the Scientific Basis for National and International policymaking Related to Natural and Human-induced Changes in the Global Earth System." The budget requests a 43% increase in such research to a FY 1990 level of $190 million. This program is a key effort supporting the U.S. efforts to encourage orderly and responsible international cooperation on global change issues through the Intergovernmental Panel on Climate Change described in the answer to the following question.

SENATOR MIKULSKI: The EPA recently released a draft two-year study on global warming which includes a strategic plan to limit warming and eventually reverse the trend. The plan calls for such tactics as charging users of fossils fuels emission fees; major reforestation programs; and a total phase-out of CFCs.

These recommendations have very significant policy implications.

OSTP established the Committee on Earth Sciences to coordinate the nation's global warming research efforts, but what about the nation's policy efforts -- who's in charge of coordinating the policy?

ANSWER: The EPA draft study Policy Options for Stabilizing Global Climate does not "include a strategic plan to limit warming and eventually reverse the trend" as your question states. Furthermore, the draft study does not make recommendations.

It is very important to understand how the study is different from the kind of study implied by your question. The study has identified a number of technical options and policy options which, if implemented, could help limit greenhouse gas emissions.

These options have been identified as having technical promise of effectiveness in limiting emissions. Options have been screened based on judgements about their potential to be cost-effective. No attempt has been made to rank the cost-effectiveness of each option included in the study. No attempt has been made to estimate the government expenditures or total social costs or benefits associated with the options identified. Detailed cost and benefit analyses will need to be done before any recommendations can be made.

The magnitude, rate, and timing of any climatic change which might be caused by human activities is subject to very high scientific uncertainty. The National Academy of Sciences in a 1979 report said that, based on computer models, the most probable global warming from a doubling of CO2 is estimated to be 3 degrees C., with a 50% probability that it would be between 1.5 and 4.5 degrees. (That necessarily implies a 50% probability that it would be less than 1.5 or more than 4.5 degrees.) The latest National Academy of Sciences review of the matter and of the 1979 estimate, in 1983, led them to conclude that:

"the climate record of the past hundred years and our estimates of CO2 changes over that period suggest that values in the lower half of this range are more probable."

Because of this great scientific uncertainty and the recognition that solutions must be global, Secretary Baker in opening the January meeting of the Response Strategies Working Group of the Intergovernmental Panel on Climate Change made the following points:

- first, that we cannot wait to resolve all uncertainties before acting;
- second, that we should focus immediately on steps which are justified for other reasons;
- third, that global solutions should be as specific and cost-effective as possible;
- fourth, that solutions must reconcile the requirements for both economic development and a safe environment.

In short, that is the limited nature of the EPA draft study and the scientific and policy reasons why it does not "include a strategic plan" or make recommendations.

Currently, the Executive Branch's policy efforts have been focused primarily on getting the Intergovernmental Panel on Climate Change organized and started out on an orderly process to provide an international interface between science and policy. The panel should both identify for the scientific community information needed by policy makers to evaluate possible response strategies, and communicate to policy makers what is known -- and what is not known -- about climate change, in order to ensure that consideration of climate-related polices is based on solid scientific information. In this way, governments, and the intergovernmental community, will be able to address the issue responsibly.

These efforts have been carried out in interagency meetings, hosted by the Department of State, and in meetings of the Climate Program Policy Board of the National Climate Program Act. The Domestic Policy Council has provided policy direction to these interagency efforts.

The President's budget document stated that "The President will issue an Executive Order on global climate change setting out the responsibilities of Federal agencies and departments as well as establishing effective coordination mechanisms." At this time, such mechanisms are still being considered and evaluated within the Administration.

SENATOR MIKULSKI: When will an interagency group be established to deal with the nation's global warming policy?

ANSWER: As earlier indicated, a number of options are being considered and upon completion of the review, the President by way of an Executive Order, will establish the interagency group.

NATIONAL STRATEGY FOR OVERALL FEDERAL R&D STRATEGY

SENATOR MIKULSKI: Do you believe it's possible to establish a national strategy for overall Federal R&D spending? What role should OSTP play in establishing such a strategy? What role do you believe the Nation's scientists and engineers should play in the establishment of R&D priorities? How can we do a better job to get that contribution? What are the major obstacles to developing such a strategy?

ANSWER: The annual budget submission of any Administration to Congress automatically provides an implicit strategy for R&D spending as the outgrowth of the process of formulating a budget. A major task of OSTP is to provide additional focus and overall policy guidance for federally-funded R&D. At the higher levels of detail and specificity of R&D programs, an increasing amount of the action and responsibility must fall to the agencies.

Engineers and scientists play a crucial role in the generation and the peer review of research proposals. OSTP has historically been a place where individuals and professional organizations can present their views and ideas (e.g. research priorities) and obtain a hearing. One of the roles of OSTP is to provide a forum to maximize the contribution of the nation's scientists and engineers.

An overall research strategy must recognize the fundamentally different nature of civilian R&D, as compared with most military R&D. For example, 92% of military R&D is in the category of development -- specifically engineering and systems development new weapons systems which are planned for future production. This latter category of R&D, then, is not elective once a firm decision has been made to proceed with a given weapons system.

MEASURING THE EFFECTIVENESS OF R&D PROGRAM

SENATOR MIKULSKI: How are you measuring the effectiveness of our R&D program in meeting the nation's Science and Technology needs, and what do you do with those measures?

ANSWER: There is no one measure of effectiveness. In the case of basic research, perhaps the most fundamental measure is the rate of scientific progress (e.g. new discoveries) in the various research areas. Areas with rapid rates of progress (e.g. biomedicine) tend to receive continued strong support. Other areas characterized by a maturity in the scientific results, and a slowdown in the rate of progress do not normally receive increased support. In the case of applied research, the measure of effectivenes must consider the various missions of the host agencies.

SENATOR MIKULSKI: The science and engineering infrastructure -- personnel, research facilities and equipment -- may be in serious trouble according to many reports. How can we be sure that Federal R&D funding is helping to prevent such problems from happening and is working to improve the situation? Do you feel that such a goals important? Can we meet it without compromising the other objectives of our R&D program? What do you think we should do to strengthen the S&T infrastructure?

ANSWER: The health of the R&D infrastructure is a fundamental and continuing concern. It requires not a "get well" approach but rather an institutionalized multi-year approach. While it is not possible to make any sweeping generalizations, one fruitful approach, for example, would be to set up a Basic Research User Facility (BRUF) account which would provide an orderly approach to maintenance of the existing user facility complex, with multi-year funding for the most urgent maintenance projects. Such an account will also help provide an ongoing assessment of the R&D infrastructure.

SENATOR MIKULSKI: If large science and engineering projects are necessary in some cases to advance a particular field, how can we test to see how those projects will do in meeting the cross cutting objectives, particularly on major projects? How do we do this while protecting the long term economic interests of this Nation?

ANSWER: Typically, large projects meet several objectives, including political objectives. For example, the SSC will further international cooperation on high energy physics, maintain U.S. leadership, explore new regimes of high energy physics, and be visible evidence to our youth of the commitment of this nation to furthering fundamental knowledge. Funding for such large projects reflects a commitment of resources at the national level, rather than a detailed trade-off within a fixed amount of R&D funding that -- if a large project were disapproved -- would otherwise have been allocated to other research projects. As with other large projects (e.g. roads, dams, etc.) the long-term economic costs must be balanced against an assessment of the long-term benefits -- both tangible and intangible.

COOPERATION ARRANGEMENTS WITH INTERNATIONAL PARTNERS

SENATOR MIKULSKI: There are increasing pressures to enter into cooperative research arrangements with international partners, particularly on major projects. How do we do this while protecting the long term economic interests of this Nation?

ANSWER: In a number of cases, cooperative research arrangements can protect the long term economic interests of this nation by spreading the costs of a large research project, and otherwise pooling the resources of several nations. While in principle this could lead to acquisition by foreign nations of U.S. technology, this kind of transfer can occur in both directions.

MATH AND SCIENCE EDUCATION

SENATOR MIKULSKI: What are some ways we can use our R&D efforts to enhance math and science education, not only to produce scientists and engineers, but to improve the science and math literacy of the entire population? Should this be a major goal of our R&R programs?

ANSWER: One promising promising way to enhance math and science education is through tutorial programs. Such teaching aids should continue to be developed. Our actual R&D programs are an appropriate vehicle only insofar as they could promote individual scientists to participate in local outreach programs focussed in this area.

DEFENSE VS. CIVILIAN R&D

SENATOR MIKULSKI: How should we review the balance between defense and civilian R&D?

ANSWER: It is difficult to speak of a balance between defense and civilian R&D, because the nature and objectives of the two programs are so different. As previously discussed 92% of military R&D is in the category of development -- specifically, engineering and systems development of new weapons systems which are planned for future production. Defense R&D is not elective once a firm decision has been made to proceed with a given weapons system.

INDUSTRIAL TECHNOLOGY

SENATOR MIKULSKI: Do we need to focus our R&D efforts more effectively on problems and opportunities about industrial technology; e.g., High Definition Television, superconductivity, advanced materials, etc.? Is some reallocation of resources called for?

ANSWER: The most crucial issue here is not R&D as such, but rather efficiently making the transition between R&D and industrial production in various industrial technologies. Our most serious hurdle lies in the private sector's ability to commercialize and capitalize on the research results generated in our own R&D establishment.

ESTABLISHING R&D PRIORITIES

SENATOR MIKULSKI: What role did OSTP play in establishing R&D priorities for the 1990 budget request and what do you envision for FY 91? Will you adopt the National Academies approach? Do you have the resources to carry out such a review?

ANSWER: OSTP worked closely with the Office of Management and Budget throughout the fall budget review. We anticipate that this will be the case again next fall. The proposed increase in OSTP funding for 1990 should make possible a more comprehensive budget appraisal by OSTP than that of the preceding fall. The NAS believes that basic research should have the highest priority. We concur. The NAS also implicitly assumed that the size of the R&D "pie" was largely fixed, and that science projects would compete with each other for the same funds. We, at OSTP, on the other hand, have recommended an increased total level of funding to accommodate large programs such as Space Station Freedom and the SSC. This increased total funding reflects the assessment that these large projects merit dedicated funding at a national level.

TRAVEL

SENATOR MIKULSKI: You are requesting $130,000 for travel, an increase of $55,000 or 73%. Why is such a substantial increase necessary?

ANSWER: Of the $130,000 requested for travel, only $85,000 is for travel normally undertaken by OSTP staff in carrying out the agency's mission requirements. This is a 13.34-percent increase over the current FY 89 appropriated level and 15-percent less than that expended in FY 88. The remaining $45,000 will be utilized to support new travel costs associated with: (1) the US-China Science and Technology Cooperation; (2) cooperation under the US-Japan Science and Technology agreement; and (3) National Advisory Committee on Semiconductors.

SENATOR MIKULSKI: Please provide a breakdown of travel costs associated with U.S.-China Science and Technology Cooperation; cooperation with the U.S.-Japan science and technology agreement; and the National Advisory Committee on Semiconductors.

ANSWER: The following information is provided for travel costs associated with new OSTP initiatives:

-- US-China Science and Technology Cooperation:	$20,000
-- US-Japan Science and Technology Agreement:	$20,000
-- National Advisory Committee on Semiconductors:	$ 5,000

QUESTIONS SUBMITTED BY SENATOR KERREY

BASIC SCIENCE

SENATOR KERREY: Dr. Graham, you note that the top Bush priority in science is support for basic research. How is this reflected in the Bush budget? If funds were not being committed to big projects, such as the space station and the superconducting super collider, couldn't we do more for basic research?

ANSWER: The priority for basic research is reflected in the proposed doubling of of the NSF budget by 1993, in increases for space science and in the support for the SSC. Since the funding for the large projects is project specific, cancellation of those projects would be accompanied by a removal of funds from the President's budget. Thus, it is very difficult to predict how much, if any, additional funds might be provided for other basic research by cancellation of any of the proposed large science projects.

BUSH VS. REAGAN BUDGET

SENATOR KERREY: For the record, would tell me specifically -- by program and dollar amount -- how the Bush budget differs from the Reagan one for science and technology. We have NSF before this subcommittee; we have NASA; we need to know.

ANSWER: The budget information is found in the February 9 report "Building a Better America". That report identified the science and technology priorities of the Bush Administration within the overall budget constraints of the flexible freeze. As can be seen from the report, the science budget for the Bush Administration represents a of continuity with the Reagan Administration.

DOD R&D

SENATOR KERREY: You note that about 92% of the DOD R&D is in support of specific new weapons systems, in response to specific Defense plans.

(a) what is the other 8%?

(b) Are there any spin-offs that help us technologically industrially or in trade?

ANSWER: The other 8% of the budget is primarily for applied research, generally related to specific weapons systems. About 0.3% of the DOD budget is for basic research.

Historically, there have been numerous spin-offs from Defense research to the commercial sector. Perhaps the most significant one has been in commercial aviation, which continues to be a positive contribution to our overall balance of payments. The military programs have also been a stimulus for our electronics industry.

US INDUSTRIAL POLICY

SENATOR KERREY: Do you have a position as to whether or not the U.S. should have an industrial policy?

ANSWER: While there is a bias against the Federal Government "picking winners and losers", there is a growing recognition that the U.S. is in danger of losing its position in a number of strategic technologies such as HDTV, supercomputing, DRAM's, machine tools, numerical controllers and others. One of the dominant roles of the Federal Government in U.S. commercial enterprise should be as a buyer, stimulating the market place to produce more advanced and innovative products, knowing the Federal Government will purchase them.

SUBCOMMITTEE RECESS

Senator **Mikulski**. Well, this subcommittee will stand in recess until tomorrow, May 4 at 10 a.m. when we will take testimony from NASA.

Dr. **Bromley**. Thank you.

Senator **Mikulski**. Thank you.

[Whereupon, at 12:12 p.m., Thursday, May 3, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

DEPARTMENTS OF VETERANS AFFAIRS AND HOUSING AND URBAN DEVELOPMENT AND INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1991

FRIDAY, MAY 4, 1990

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:05 a.m., in room SD-138, Dirksen Senate Office Building, Hon. Barbara A. Mikulski (chairman) presiding.

Present: Senators Mikulski, Gramm, and Kerrey.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

STATEMENT OF RICHARD H. TRULY, ADMINISTRATOR

ACCOMPANIED BY:

- **JAMES R. THOMPSON, JR., DEPUTY ADMINISTRATOR**
- **SAMUEL W. KELLER, ASSOCIATE DEPUTY ADMINISTRATOR**
- **JOHN O'BRIEN, ASSISTANT DEPUTY ADMINISTRATOR**
- **PAUL G. ANDERSON, DIRECTOR, INSTITUTIONAL RESOURCES AND ANALYSIS**
- **THOMAS CAMPBELL, COMPTROLLER**
- **JAMES T. ROSE, ASSISTANT ADMINISTRATOR FOR COMMERCIAL PROGRAMS**
- **EDWARD A. FRANKLE, GENERAL COUNSEL**
- **MARTIN P. KRESS, ACTING ASSISTANT ADMINISTRATOR FOR LEGISLATIVE AFFAIRS**
- **DR. WILLIAM B. LENOIR, ASSOCIATE ADMINISTRATOR FOR SPACE FLIGHT**
- **DR. C. HOWARD ROBINS, JR., ASSOCIATE ADMINISTRATOR FOR MANAGEMENT**
- **BILLIE J. McGARVEY, ASSISTANT ASSOCIATE ADMINISTRATOR FOR FACILITIES MANAGEMENT**
- **CHARLES T. FORCE, ASSOCIATE ADMINISTRATOR FOR SPACE OPERATIONS**
- **GEORGE A. RODNEY, ASSOCIATE ADMINISTRATOR FOR SAFETY AND MISSION QUALITY**
- **ARNOLD ALDRICH, ASSOCIATE ADMINISTRATOR FOR AERONAUTICS, EXPLORATION AND TECHNOLOGY**
- **DR. LENNARD A. FISK, ASSOCIATE ADMINISTRATOR FOR SPACE SCIENCE AND APPLICATIONS**
- **KENNETH S. PEDERSEN, ASSOCIATE ADMINISTRATOR FOR EXTERNAL RELATIONS**

CHAIRMAN'S OPENING REMARKS

Senator **Mikulski**. Good morning everybody. The subcommittee will come to order.

BUDGET REQUEST

Today, we meet to review the 1991 NASA budget. NASA is requesting a 1991 budget of $15.2 billion, an increase of $2.8 billion, or 22 percent, over their 1990 appropriation.

Among the highlights of this year's budget request are large increases in NASA's personnel and space station programs. In addition, there are three new starts proposed: the Earth probes program, the Earth observing system—those two would compose the Mission to Planet Earth—and the first phases of a Moon-Mars initiative.

On Tuesday, Senator Garn and I were among a handful of legislators who participated in a space summit with the President and Vice President. It was the first such meeting between a President and congressional leaders in 15 years, and I was proud to be a part of it.

At that meeting, I lent my voice to asking for a sustainable revenue source to be identified for the space program. The President made a compelling case for his 1991 budget during our meeting. At the same time, however, there were those of us present who stressed that the problem with funding his request was the absence of this sustainable revenues. That forces the design of America's civilian space program. Without that kind of revenue stream, it is unlikely that the subcommittee will have a sufficient 302(b) allocation that will provide NASA with a $2.8 billion or nearly $3 billion increase over last year.

NASA'S TRIAD

That doesn't mean that we don't like the ideas that are proposed, but what it means is that we will be forced to once again make difficult choices about NASA's budget. In that environment, it is my intention to fund those programs that first and foremost constitute NASA's triad. First, the agency's people, facilities, and core science and aeronautical research programs. Second, our Nation's space transportation system, which is the shuttle and the expendable launch vehicles; in this case ELV's, work to our advantage. And third, the space station program, which is important for any long-term future in space, particularly in the areas of microgravity and materials processing, and eventually housing the people who would then jump start even further into space.

It is my hope to explore these and other key issues with Admiral Truly and his team. I want to recognize Senator Phil Gramm, but before I do, I want the record to show that Senator Garn is in Utah on a significant safety hearing in his State, and will be submitting questions for the record. His absence is not an absence of interest but is a compelling need that he is in Utah over some transportation issues that pose significant safety risks to the people of Utah. And he left the budget in the safe hands of Senator Phil Gramm and myself.

And with that, I'll turn to Senator Gramm.

SENATOR GRAMM'S OPENING REMARKS

Senator **Gramm**. Madam Chair. Let me thank you, Admiral Truly. I'm happy to be here today.

The Chair has touched on the problem of NASA funding. There's the problem of priorities and, unfortunately, Congress is often more interested in investing in the next election than they are the next generation.

I am proud of the fact that the President has again submitted a very strong science and technology budget. It is a budget which invests in the future.

The proposed level of increase for NASA in general and the space station in particular, I think, show that on the President's part there is a strong commitment to move forward in this area that is so vital to the future of America and the competitiveness of America in the world market.

I, for one, support the funding levels that have been proposed. I intend to the maximum extent possible to fight for those levels. I think they represent a sound investment. I just want to congratulate you for the good work that you're doing.

I'm proud of NASA. Obviously, I'm proud of Texas' leadership in NASA. When you have a program that is investing in the future, that is developing new techniques and new technologies and new knowledge, and you have Texans important in the leadership of such a program, you're clearly doing the Lord's work. I want to encourage it. [Laughter.]

Senator **Mikulski**. Admiral Truly, we're now going to turn to your testimony concerning the fiscal year 1991 appropriations. Admiral, you may proceed.

ADMIRAL TRULY'S OPENING STATEMENT

Admiral **Truly**. Thank you very much, Madam Chair. With your permission, I'd like to enter my printed formal statement into the record, but I would like for a few moments to make some informal comments as to this budget from NASA's point of view.

Senator **Mikulski**. Without objection, your entire statement is entered into the record. We would hope that you do not follow the practice where people submit their statement and then talk longer than if they would have read it. [Laughter.]

Admiral **Truly**. Well, it's a complicated budget, and I would like to talk about it. But I can assure you that I'm not going to read to you.

ACCOMPLISHMENTS

It really is a pleasure for me to appear today before this subcommittee to justify this 1991 budget request. I'd like to start by pointing out some of the accomplishments that NASA has achieved since we were here in May of last year. Because I think that this 1991 budget request would be an unreasonable request if it was not in the context of what we have achieved.

Since I appeared before the subcommittee last May, NASA has launched seven successful shuttle missions, including three DOD flights. We have put Magellan on its way to the planet Venus. We have put Galileo on its way to the planet Jupiter. We have recovered the long duration exposure facility from space and it is now here on Earth in the hands of our scientists, and the Hubble Space Telescope is in its element today—and I'd like to give you a status of that in just a moment—but that's not all.

EXPENDABLE LAUNCH VEHICLES

In the expendable launch vehicle area, since we were here last May, we've had successful launches of an Atlas to put the latest of the Flt Satcom UHF satellites from the Navy in orbit. We have an exciting cosmic background explorer mission in orbit that is already doing what I believe will become prize winning science, which was launched on a Delta. We helped the first commercial company to put a commercial satellite into space by lifting the Pegasus to a launch platform in the air with a NASA B-52, and we're very proud of that. On the pad, today, we have the next shuttle flight. We also have a scout mission on the pad; and within just a few months, we have the launches of three important ELV missions planned—roetgen satellite [ROSAT], combined radiation and release effect [CRRES], and the NOAA-D missions. All in all, we have had 10 successful shuttle flights in 18 months since the *Challenger* accident.

HUBBLE SPACE TELESCOPE

Speaking of the Hubble Space Telescope, let me give you an up-to-date report. Since we just put it into orbit last week, we had a good night last night and past couple of days. The telescope is very complex, but we have been checking it out, and we're just moving into that phase of the checkout where we have not started to do the science, but have started to run software programs and do preliminary checkouts, and everything is really looking good. We had a fine guidance sensor lock onto a 13th magnitude star yesterday. We have a very minute oscillation that we're working on, and we are absolutely confident that we will cure that. It does not appear to be a hardware problem. It's somewhere and it will be found in the checkout. I feel very good about that.

All in all, the Hubble Space Telescope is on orbit and doing well.

The successes of this past year took the combined efforts of the people in NASA and our contractor team, and also the support of this subcommittee and of the Congress. Fiscal year 1991 is going to be an absolutely important and crucial year for us. President Bush has shown his most strong support in his statements and speeches that he's put on his record, and also in the budget requests that he's laid before this committee and the Congress itself.

As you pointed out, this request for NASA in 1991 is $15.2 billion. It represents a significant increase of almost $3 billion. However, I'd like to say a couple of other things about this budget request. First of all, I think that this is the most balanced NASA budget that has been presented to the Congress in my history, at least, at NASA headquarters. As Senator Gramm mentioned just a moment ago, I think that this budget request as presented is a very sound request.

The point that I did want to make about this requested increase is that about 98 percent of the increase in this budget is needed to continue programs that have already been approved and have already been appropriated by the Congress of the United States. Let me tick off what makes up those programs that are in the 98 percent of this increase.

SPACE STATION FREEDOM

Space Station Freedom is the most logical and the most important program that we have going for the future. It is on track. As the months have gone on, I have been delighted to watch it as it becomes more and more solid and that there is a significant request in this budget for Freedom.

The space shuttle. I just recounted 10 safe missions.

The space transportation business continues to be a risky business, but we are managing that risk to a point that I believe I can tell you for sure that I am personally comfortable with it and we're not going to back away from safety to make this world-class capability continue.

Cutting edge aeronautics is a part of this 98 percent. As you know, you're supporting us in renovating our wind tunnels across the country. That is a direct connection between aeronautics and competitiveness.

We have the healthiest space science program that the world has ever seen and, in Galileo and Magellan and Hubble, we have not even come to the fun part yet; we've only watched the launches. But the science over the next decade, as it comes pouring in from these and other science missions, is the most important part of our budget request.

Opportunities in space commercialization are represented in this budget request.

The competitiveness that's represented by our research and technology programs is a part of this request.

And then, the tools to do the job, our space tracking program, our worldwide network that allows us to do these missions, is a part of this request. The R&PM budget, the people, the facilities maintenance of the tracking equipment that allow us to keep the programs on track, are part of this request. The construction of facilities, the tools, the buildings that allow our people to do our job, are a part of this request.

And possibly, most important are the dollars that we have in our education budgets to allow NASA to fulfill what I believe is a very real responsibility and a very exciting program, to encourage our young people to become literate in math and sciences.

NEW INITIATIVES

Only 2 percent of this budget is for new initiatives, but they are very exciting and important initiatives.

First, Mission to Planet Earth, the combination of the Earth probes and the Earth observing system to look back at perhaps the most complex planet in the solar system, the Earth, and one about which we frankly are woefully ignorant. The purpose of our programs is to better understand the Earth.

And then finally, a small amount of money for some initial technology work on a vision for a space program for the next century, as the President has laid out, an exploration that would start with Space Station Freedom in the 1990's and then back to the Moon, and to Mars in the next century. The success in this fiscal 1991 budget, I clearly understand, is going to have to be carved out in a very difficult way and it's going to be a direct function of the level of congressional support, and the level of your 302(b) allocation.

The importance of this budget to NASA and the civil space program was highlighted, Madam Chair, as you noted a few minutes ago, by the meeting that the President held in the Cabinet room with the leadership of the Congress, Republicans and Democrats, Senate and House, and his entire top team, the Vice President, and the other staff members. I personally thought that was a very productive meeting. I was pleased that it occurred. It did point out directly to the President many of the difficulties that the Congress has, but I was pleased as each of the senior leadership expressed his view to the President. They all seemed to be supportive of investing in the future of the country and recognized that the space program is a central part of that future.

Besides the 1991 challenge, I'd also like personally to thank you and the subcommittee for, and to reiterate the importance of, the fiscal year 1990 supplemental that is presently going to conference. That measure is needed to provide transfer authority in order to help the men and the women and the facilities of NASA here this year. In order to be most useful to us, I personally hope that it will be acted upon in a very timely manner.

SPACE PROGRAM AT CROSSROADS

All in all, when I look at the world change that's going around the globe today, I think that America's civil space program is at a crossroads, and it's a crossroads of increasing importance. Thirty years ago, the United States and the Soviet Union were the only games in town in the space business. But the world has changed in that regard. And I believe that the future will see that space becomes more and more important in international and global affairs, not less and less important. Therefore, I think our present budget request will continue to position the United States to be a major player and a major leader in this portion of our national life.

I realize the difficult decisions you have in dealing with our request and with the other things going on in Congress, but I certainly hope that the President's science and technology and education budget requests that are represented in this hearing today fare well in fiscal year 1991.

INTRODUCTION OF ASSOCIATES

I've brought with me today here at the table, the Deputy Administrator of NASA, J.R. Thompson. On my right is Tommy Campbell, NASA's Comptroller, and here in the room are the various Associate and Assistant Administrators that represent the programs: the Space Shuttle, the space station, space science, the education programs, and so forth, so we've come prepared to, hopefully, help support you today in answering any questions that you may have.

And, again, I'm delighted to be here.

Thank you very much.

[The statement follows:]

STATEMENT OF RICHARD H. TRULY

Madam Chair and distinguished members of the subcommittee, I welcome this opportunity to present the President's fiscal year 1991 budget request for the National Aeronautics and Space Administration and to discuss the future direction of our nation's civil space and aeronautics program of which this budget is a part. We have just concluded a year in which NASA maintained its role as a principal symbol of American technological and scientific prowess. An improved and more reliable Space Shuttle fleet was employed in a demanding series of missions, and a 12-year hiatus in planetary launches ended, as sophisticated spacecraft were launched on journeys to Venus and Jupiter. At the same time, 12 years of innovation and ingenuity by a control team of NASA scientists, engineers and technicians culminated in Voyager 2's encounter with the planet Neptune, an event that captivated a world audience.

President Bush is committed to a sustained, continuing and balanced program which advances U.S. leadership in aeronautics and space. The President's fiscal year 1991 budget request for NASA of $15.1 billion in discretionary authority provides the resources necessary to maintain us on a steady course toward achievement of that goal. A summary of NASA's fiscal year 1991 budget request is appended to this statement.

The President's budget request acknowledges that NASA's activities embody highly significant contributions to our efforts toward building a better America. Our programs are aimed at building mankind's store of knowledge about our planet and our universe, at helping to understand and to protect our fragile environment, at enhancing U.S. economic competitiveness, and contributing to an intangible but critical national pride in ourselves and our accomplishments as a nation.

One of the most valuable contributions of the U.S. space program is that it provides a strong stimulus to young students' interest in science, engineering and mathematics education. This budget, in fact, enhances specific NASA efforts aimed at using space endeavors in classrooms around the country to help in assuring American preeminence in math and science education by the end of the century. In addition, NASA's extensive international cooperative activities in programs like Space Station Freedom and Mission to Planet Earth allow our efforts to serve U.S. foreign policy, as well as domestic policy, goals. NASA is a vital part of the American infrastructure. Investment in civilian space research and technology has contributed to America's infrastructure of today and will serve as a foundation for America's infrastructure of tomorrow.

SCIENCE, TECHNOLOGY AND EXPLORATION

NASA's mission embodies three major areas of endeavor: science, technology, and exploration. Our undertakings in these areas have intrinsic merit while, at the same time, serving broad national objectives. I would like to describe briefly some of our activities in these areas and attempt to place those activities in a broader national context.

INNOVATIVE SCIENCE

In space science, we are expanding our base of knowledge with benefits both foreseen and unforeseen. We have entered a "golden age of space science" with 36 major missions planned over the next five years. We are returning to the planets with Magellan, Galileo, Mars Observer, and CRAF/Cassini. We have emerged from a period of more than a decade of virtually no activity. From now until well into the next century, there will be an uninterrupted sequence of U.S. planetary missions in their primary phase of exploration. Before the end of the century, we will have launched three Great Observatories, starting with Hubble Space Telescope which we just launched. The Hubble Space Telescope, launched by the Space Shuttle Discovery on April 24, 1990, is continuing with its initial activation and checkout program. This period, called Orbital Verification, is proceeding satisfactorily. With only two minor exceptions, both the hardware and software are performing precisely as designed. The temporary difficulty during the solar array deployment is under investigation, however it will have no impact on science operations. We have traced the High Gain Antenna problem to obstruction by an electrical cable and expect to adapt flight software to restrict movement into this area. The effect on HST operations due to this restriction should be very minor. At this point in the checkout all other flight hardware is operating normally. A dedicated team of NASA employees, support contractors and the Space Telescope Science Institute are working carefully and systematically to ensure that the start of HST's mission is a success. Their dedication and hard work have paid off, and we look forward with great anticipation to the future.

These are exciting times—our understanding of the universe will soon increase manyfold. In addition to our robotic programs, science is also served by men and women aboard the Space Shuttle, as it will be in the future on Space Station Freedom. Microgravity research in materials and life sciences is enhancing our fundamental understanding of materials processing and life functions. This fundamental understanding will lay the groundwork for future manned activity in space and also for future commercial activity on the ground.

A critical element in our science program is Mission to Planet Earth, NASA's major contribution to the U.S. Global Change Research Program. This budget request initiates the Earth Observing System as a major part of our activities in service of the global environment. We will monitor the Earth, tracking environmental changes over many years. Just as we study the other planets, we will study our own—looking at the complex interactions among the land, the sea, the ice, and the atmosphere. We must understand carbon dioxide build-up, ozone depletion, deforestation, and desertification as an essential element of intelligent action. We will do our part to improve this planet for our children and our grandchildren.

COMPETITIVE TECHNOLOGY

NASA has been a preeminent force in the development of America's advanced technology over the past 30 years. We develop technology to do our space flight programs and to develop a base to support our national leadership in aeronautics. This budget request contains investments in cutting-edge aeronautics and space technologies which will enhance U.S. competitiveness abroad and economic well-being at home. These efforts also support U.S. industry's interests in space commercialization.

Aeronautics in the United States is unique in its contribution to the balance of trade, to the transportation infrastructure for world commerce, and to our national security. It is also a symbol of U.S. technological might. NASA, as our country's focal point for aeronautical research and technology, will continue to address these critical issues with high-leverage technologies—advancing at a rate unmatched since the 1950's—in order to maintain and strengthen the U.S. competitive posture in aviation.

NASA continues to lead the development of the aeronautics technology base that is critical to the design of all future advanced aeronautical systems. Emphasis is being placed on numerical simulation techniques, including new, massively parallel computers, which will lead to further advances in the design of aircraft and propulsion systems and to the understanding of aerodynamics critical to more efficient flight. NASA will continue to develop long-term technology solutions to support the Federal Aviation Administration in addressing issues such as congestion, airspace safety, and aging aircraft. Advanced composite materials and structures research efforts will be increased to exploit new, higher temperature organic composite materials that will significantly lower the weight and cost of high-speed aircraft. The High-Speed Research program will address the critical environmental issues associated with high speed civil transports, providing the foundation for future decisions on technological and aircraft development. These aeronautics programs will offer major payoffs in aircraft performance and capabilities and provide substantial positive impact on U.S. economic competitiveness.

Our joint effort with the Department of Defense on the National Aero-Space Plane spans the full spectrum of technology development. The results of this program could lead to a whole new generation of vehicles, to U.S. preeminence in high-speed aeronautics, and to rapid, flexible, and efficient access to space.

Investment in space technology is essential to maintaining the nation's capabilities and to ensuring future U.S. leadership in space. Throughout all our technology development efforts, we seek new, innovative concepts. We will be working on automation and robotics; propulsion; power; information technology; and large structures and control, all of which will enable efficient, reliable access to Earth orbit; enhance operations in Earth orbit; and increase the effectiveness of science missions from Earth orbit. We will also be developing the range of critical technologies needed to expand human presence and activity into the solar system.

BOLD NEW EXPLORATIONS

On July 20 of last year, the President provided a focus which will guide this nation's space efforts for decades to come. His Moon-Mars Initiative directs us to complete Space Station Freedom in the 1990's, then, in the 21st century, to return to the Moon, this time to stay, and to venture on to the planet Mars. In so doing, we are addressing one of the most fundamental of human needs—the need to explore and expand horizons. That innate desire fueled the discovery of America, our Westward expansion, and our treks to the Earth's polar regions.

It is with this budget that we will begin mankind's latest historic journey. We will be living and working permanently in space well before the end of this decade. And then we will be undertaking space exploration with our return to the Moon and journey to Mars. We will be casting the nets widely to capture America's creative energies. We will enlist the broadest possible involvement of U.S. industry, universities, and other Federal agencies and research facilities. And, in parallel with this search for new ideas from outside sources, we will continue our own efforts to conduct mission concept and systems analysis studies, science activities, and technology development efforts. These efforts will follow up on last fall's 90-Day Study which established a data base, and which will be one of the points of departure for our upcoming efforts.

Our early activities will focus on technology development with a search for new and innovative approaches—approaches which could have significant impacts on human exploration schedules, cost, risk, and performance. Spurred by this focus on technology development, those efforts will provide early ancillary benefits such as strengthening U.S. capabilities in key industries, stimulating science, engineering and mathematics education, and promoting excellence in science and engineering disciplines. The Moon-Mars Initiative will include robotic science missions as an integral part. This budget request includes a significant enhancement to Mars Observer which is scheduled for a 1992 launch, and final definition studies for two fiscal year 1992 development starts—Lunar Observer and Lifesat. These missions, in addition to significantly advancing scientific knowledge of the Moon and Mars, will obtain data needed to assist in the design and development of subsequent human exploration systems and missions.

ENABLING INVESTMENTS

The high standards and difficult goals we reach for in NASA require investments in our people, facilities, and transportation capabilities to support our missions. The Space Shuttle, Space Station Freedom, Expendable Launch Vehicles, the Tracking and Data Relay Satellite System, and the unique capabilities of NASA's facilities and workforce all form the critical base, without which none of our missions can be achieved.

The Space Shuttle is vital to our space objectives. The program continues to demonstrate its successful return to flight, accomplishing ten remarkable flights since September 1988. The missions have been smooth, and we have stayed extremely close to our target launch dates—particularly on the planetary missions with narrow launch windows. We remain committed to safe and reliable flight operations and will continue to seek ways to increase our margin of safety in what is inherently a risky and unforgiving operational regime. The new manifest recently issued includes eight flights in fiscal year 1990, 10 flights in fiscal year 1991, and 11 flights in fiscal year 1992, as we work toward a flight rate of 12 per year.

In addition to the Space Shuttle, Expendable Launch Vehicles (ELVs) are used to launch NASA spacecraft. These launch services are being procured from the private sector. NASA is committed to encouraging a healthy and expansive commercial space industry. As an example, NASA's nationwide network of 16 Centers for Commercial Development of Space represents a unique example of how Government, industry, and academic institutions can combine resources and talents to develop an industry-driven technology base in order to encourage and foster significant private sector investment and participation in commercial space ventures.

It is also important to continue to invest in measures which enhance the safety, reliability, and performance of the Shuttle system. The Advanced Solid Rocket Motor will incorporate changes in configuration, design details, and materials to meet more stringent design requirements and enhance safety margins and reliability. In addition, we expect a 12,000 pound increase in the delivery capability of the ASRM-equipped Shuttle. Funding is included in this budget request to continue the procurement of structural spares to replace those being used in the building of the new orbiter, Endeavour. The production of these spares will help maintain the capability to produce orbiters and significantly reduce the time to repair a damaged orbiter or build another, should the decision be made to do so. NASA has recently finalized an agreement with Rockwell for the commercial provision of the hardware necessary to provide an extended duration orbiter capability. The hardware being developed under this program will allow the orbiter to stay in orbit up to 16 days. This capability is targeted to support the flight of USML-1 in fiscal year 1992.

The current Space Shuttle fleet provides a base for our current requirements of transporting people and payloads to low-Earth orbit. A key issue for conducting human exploration missions is how large amounts of cargo can be transported to Earth orbit in the most cost-effective manner possible. Preliminary studies indicate that a significant increase in the lift capability to low-Earth orbit will be required. In the Advanced Launch Systems program, NASA and the Department of Defense have been working closely together on the advanced cost-effective technologies required to meet the future needs of both agencies. NASA also has studies under way, through fiscal year 1990, on the Shuttle-C, an unmanned heavy-lift vehicle derived from Shuttle components. Beginning in fiscal year 1991, NASA will consolidate all these activities under the Advanced Transportation Technology program. Funding is included in fiscal year 1991 to expand this program to pursue definition activities of heavy-lift vehicle concepts to support Lunar and Mars missions and expand NASA development of a low-cost advanced main engine propulsion system.

Space Station Freedom is the cornerstone of our space program in the 1990's and beyond. It will be a facility for the conduct of research and technology development that is enabled or greatly enhanced by the presence of humans in space. It will contain attachments for the mounting of telescopes and other scientific instruments and it will encourage the development of robotic technologies to aid the crews in maintenance, repair, and replacement. Recently, the management of the U.S. polar platform has been transferred to the Office of Space Science and Applications. The U.S. polar platform and the European polar platform will contribute directly to the Space Station Freedom on-orbit operating concept and will remain fully subject to our international agreements with Europe, Japan and Canada. By providing the opportunity to spend long periods of time in space, the Space Station will be a testbed for the development of technologies for human exploration of the Moon and Mars. It could also evolve into a transportation hub for the exploration of space.

This is a critical time for the Space Station. The program is in transition from the preliminary design to the fabrication and testing of development hardware. A major review of the program, conducted in the last half of 1989 with U.S. users and our international partners, resulted in a rephasing of the program while preserving the same basic configuration and capabilities. All major contractors are on board, as are many of the subcontractors. The NASA program organization has been strengthened. All participants are looking forward to continuing the momentum of the effort.

The NASA Ground and Space Communications Networks provide the vital spacecraft operations, tracking, telemetry, command, data acquisition, communications, and data processing to meet the requirements of all NASA flight projects. This is accomplished through the use of a network of NASA ground stations and by three Tracking and Data Relay Satellite (TDRS) spacecraft working with a highly specialized ground station. This budget request continues development funding for a second Tracking and Data Relay Satellite System (TDRSS) ground terminal, additional TDRS spacecraft, and final definition studies of an Advanced TDRSS to extend network service into the 21st century and accommodate the future mission requirements projected for this era.

NASA's unique facilities and technical expertise are the underpinning for the successful accomplishment of the nation's aeronautics and space programs. We cannot be leaders in space exploration without a first-class institutional capability.

Eighty-five percent of our research and development and operational funding goes to private sector contractors. We must have an in-house workforce that is technically at the forefront to be able to effectively monitor and direct these efforts and understand the details of the technology and science to be accomplished. The fiscal year 1991 budget request contains an increase in the number of civil servants who are urgently needed to meet the increased workload associated with the Earth Observing System program, the Space Station Freedom program, and to enhance the capability of the work force.

The need for first-class facilities is also key to maintaining our nation's leadership position. The research laboratories, computing capabilities, aeronautical facilities, Space Shuttle launch facilities, rocket test stands, and deep space tracking stations of NASA are unique national resources. The NASA wind tunnels are used not only by NASA but are also depended on heavily by the Department of Defense and the U.S. aerospace industry. They are key to developments in the aerospace industry, making the industry more competitive. The agency is currently in the third year of a five-year revitalization program to modernize NASA's major wind tunnels. This program has been formulated to restore NASA's aeronautical research and development facilities for productive use for the next decade and into the 21st century. The Numerical Aerodynamic Simulator is a preeminent computing capability required to obtain solution of complex aircraft design geometries which are currently intractable. All these facilities must be maintained to protect the huge investment the nation has made in them. The repair, rehabilitation, and modernization of NASA's facilities is a high priority of the fiscal year 1991 budget request.

SUMMATION

Madam Chair, this proposed budget is unique for several reasons. First, the budget has been formulated upon a foundation of a series of highly successful Space Shuttle and space science missions. With the transition to fabrication of Space Station Freedom, the initiation of an ambitious effort in Mission to Planet Earth, and the undertaking of a technology program to enable human exploration beyond Earth orbit, the NASA program has assumed a broader and more complex dimension. As a result, we now find ourselves at the boundaries of three new frontiers. One is the frontier of scientific understanding of our universe, our solar system, and our own planet. Another is the frontier of technology for the next century—the ability to do reliably, safely, and economically everything that the challenges of space demand. And the third is the frontier of the human spirit which will be crossed when humans are able to live and work on other planets.

The proposed fiscal year 1991 budget demonstrates concretely the President's commitment to provide the resources required to advance these frontiers and to establish a robust American presence in space. While the resources required represent an increase over prior fiscal years, the dominant portion of those resources are needed to support the ongoing program previously approved by the Congress. However, as I have stated, the total program enabled by these resources represents an investment in America for both the near term and for future generations, and, I believe, merits the full dollar investment reflected in the President's request. I earnestly seek the support of this Subcommittee in obtaining Congressional approval of the $15.1 billion program as outlined in President Bush's budget request for NASA.

Madam Chair, this concludes my prepared remarks. I would be pleased to respond to your questions and those of other Members of the Subcommittee.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FY 1991 BUDGET SUMMARY

[Millions of dollars]

	Fiscal year—	
	1990	1991
Research and development	5,246.0	7,074.0
Space flight, control and data communications	4,555.7	5,289.4
Construction of facilities	437.3	497.9
Research and program management	2,049.2	2,252.9
Inspector general	8.7	11.0
Total budget authority	12,196.9	15,125.2
Outlays	12,025.6	14,136.7
Full-time equivalents	23,735	24,466

NASA'S STRATEGIC PLAN

Senator MIKULSKI. Thank you, Admiral Truly.

We're going to proceed with our questions. I have several related to the appropriations that I have on behalf of the committee. Then I'm going to raise some questions that others have raised, to give you a chance to comment and for us to have a conversation with you, for example, on some of the issues related to the space station.

So I'll ask questions for about 10 minutes and then turn it over to Senator Gramm, and then return to my own questioning, and we'll go back and forth.

First, Admiral, as you know—and I don't want to repeat myself when I talk about the tough decisions in this particular subcommittee—my question is to you, have you had the opportunity to develop the agencywide strategic plan which we've asked for before, during the fiscal 1990 appropriations process?

Admiral TRULY. I know that you have been very interested in our strategic plan and so have I. And I'm happy to have the opportunity to talk to you and tell you where we are.

The one strategic plan in NASA that has gained the most acclaim is the strategic plan that Dr. Fisk has done for the space science and applications portion.

Our other major program offices are working on theirs. If I might, I would like to give you my personal view. And I think if we got Dr. Fisk up here, he would share this with you. But I'll let him say for himself.

I think that the success of a strategic plan has to be a top-down effort. I believe that NASA, in my mind and that of J.R. Thompson and our collective senior leadership minds, is in an excellent position to build the agency's strategic plan. But to be honest with you, in the little bit less than a year that I've had in this first year as the NASA Administrator, I have not been able to personally lead this planning effort. But I can assure you and commit to you that I plan to do that.

I think that the groundwork of plans like this is being laid very well. It's a job that I look forward to very much and intend to lay the groundwork for it, because I think it's important.

Senator MIKULSKI. Admiral, let me tell you why I think it's important.

First of all, other scientific agencies and businesses, private sector businesses do it. It gives a guide as well as a plan for future long-term funding. My concern is that NASA's budget does not develop in the way the Pentagon budget's, which is lurching from one weapons system to one troop allocation to whatever. We're investing in the next generation. These, then, are investments that have to be identified and then sustained over a long period of time.

Just as you need a navigational star chart to get you to the stars, we need a navigational chart to provide resources to do that. I'm not looking for some big complicated plan, like an environmental impact statement or something else like that. We would really encourage NASA to prepare a strategic plan, and we asked for it last year.

We know that it's been a busy year for you, but we think it would help.

Having said that, let's go on to the budget priorities that are contained in this appropriation.

BUDGET PRIORITIES

First, I know that you place a great deal of emphasis on people. It's one of the things that we have to deal with in the urgent supplemental. From what I understand, NASA has made funds for work force needs a high priority.

Does this emphasis on people needs mean the request for a 17-percent increase in R&D for your research and program management is your No. 1 priority in the budget?

Admiral **Truly**. We can't accomplish our missions unless the core capability of NASA is provided. Frankly, when I look over the past several years at NASA, we have found ourselves in a situation where the core capability has been shaved and shaved beyond the point with which I'm comfortable. And that's the reason that you have seen J.R. Thompson and I, time and again, talk about people, talk about facilities, and not just new buildings. Talking about the maintenance of important buildings that were built in some of our centers several decades ago. Therefore, we have continually pointed out the need for funding for this core of people, facilities, travel money, and the tools to do the job. And we just can't accomplish our future ambitious goals without taking care of that.

Senator **Mikulski**. Then, when you take a look at the appropriations, the words "research and program management" doesn't sound like personnel, but it's the old-fashion word to say, your personnel budget? Am I right in saying that this is to adequately staff and meet the personnel requirements, this has to be your No. 1 priority?

Admiral **Truly**. We can't do our job without it. Incidentally, I wish that we did have a different name than research and program management [R&PM], or institutions. Those things are not as intriguing as the Hubble Space Telescope and these other things, but they're absolutely fundamental.

If we got into a situation, of course, where our programs were cut drastically in one area or another, that would perhaps ease our requirements in this core capability.

But my fundamental answer to you would be, "Yes." Our highest priority is simply to make sure that NASA continues to have those people and facilities to do our job.

Senator **Mikulski**. I understand that this is particularly true at Goddard and at Kennedy, that essentially their personnel account is really their biggest priority right now?

Admiral **Truly**. I'm not sure that I would single out a particular portion. I think it's more endemic across the agency. If you notice, from center to center, each center has a different complexion. For example, if you go to some of the older centers, like Ames or Lewis, which were built many years ago, there we have major problems in facilities maintenance. If you go to Goddard and Kennedy, we tend to talk about problems in people to do the job.

SHUTTLE/SPACE STATION FUNDING PRIORITIES

Senator **Mikulski**. Let me move on to some other budget priorities.

Where would the shuttle and the space station fit into your funding priorities? Would they be, for example, among your top three, along with personnel?

Admiral **Truly**. Well, let me comment that we have seen what happens to a space program with a major accident. I believe that if you asked, now that you have provided us with that core of people and facilities to do our job, what would be the highest priority as we move into the flight programs, I frankly think it's our capability to do them through the safety and support of the space shuttle program. Ten shuttle missions in 18 months, superbly executed, have put almost the equivalent of one-half a billion pounds of usable hardware into low Earth orbit if you calculated it due east at the cape. And we have got to protect that resource. I am not going to back away from our commitment to take this risky business and manage it in a way that we reduce and manage that risk. So the operational space shuttle program is crucial.

With respect to Space Station Freedom, as we have testified, we've worked on the program and we've dealt with our international partners. All of our long-range strategic plans assume and are based on that capability. And in the last year, with the team that we have in place, I have watched it almost on a week-by-week basis become more and more stable. And I personally think that there's a point in the program where we have to back off and let the engineers do their job and build it, and they can't do it without a stable budget.

So I do believe that it's a most important part of this budget. On the other hand, again, it depends on the ability the subcommittee has with the 302(b) allocation and with the way that you finally appropriate the funds. How deep those cuts are would determine whether, for example, you would fully fund the space station with a huge cut in the rest, where reductions would be taken out of aeronautics or science. Of course, I wouldn't recommend doing that, but the space station is an extremely important part of our priorities.

BUDGET CUTS

Senator **Mikulski**. The House and Senate budget resolutions assume a $1 billion cut in the 1991 budget request. Now, it's not over; there's a budget summit over the weekend. But this is a drama that's unfolding and we hope it's not a melancholy drama. But if we had to cut between $500 million and $1 billion from NASA's 1991 request, how much do you think we could take from these areas? Or would you recommend other areas? I'm not saying that we will cut. Essentially, I'm talking contingency plans here.

What would your comments be, Admiral?

Admiral **Truly**. So far, you've asked me about the core and about space shuttle and about space station. And let me just characterize those three.

We can't do our job without the core. It needs to be funded. In space shuttle, I said we're not going to back away from safety. The program is being managed very tightly and we're to the point that if we took major cuts in the space shuttle program, they would not come out of the way we do the missions. They would come out of probably some of our ability to fly some of those missions, which is the very purpose we're in business. In the space station, of course, it's a priority of the Congress to get through this difficult situation and to determine with our advice, I hope, as to how to treat it. But I can tell you this: the space station program request for 1991 is what it takes to build the present station and keep it on schedule. We cannot do the job without those funds.

When we went through the OMB process this year, our station request was trimmed somewhat. Nevertheless, we believe that the request, as presented to the Congress, can keep the station as designed on schedule, which I think is most important. I believe, as I've told you before, that if we allow the program to continue to slip and slip, we're going to lose the capability for the country. If we sustained a large cut in the space station or even a small cut, what we're going to simply have to do is first look for content in the program. And we just finished doing that in the past 12 months.

And then, I don't know, really, where to turn, other than to look at the schedule. And when you slip a schedule, it's going to bow wave costs out into the future.

Senator MIKULSKI. Admiral, what you're saying is that your so-called "Research and program management" account, which is your personnel, your people, your salaries, your construction of facilities, and then our major concern is space transportation which is the shuttle, some of the things related to the shuttle C.

First of all, we have an aging shuttle fleet. Those top three things—shuttle, space transportation, the station, and your personnel and facilities, particularly—are three really key things that must be funded. Am I absolutely right in that, that you couldn't skimp? In other words, it's already been skimped?

Admiral TRULY. The only problem I would have with your characterization, I think, is that after providing the core to do the job, and after guaranteeing that we're going to continue to have a safe and capable world-class transportation program, I would not say that, faced with a $1 billion cut, as has been threatened, that we should take it all out of aeronautics, which you haven't mentioned, or take it all out of space science.

However, you have identified the major portions of this budget that are most important to us. And that is: the core to do the job, the transportation to safely execute it, and the largest new program that has now been on the books for a number of years and been supported by the Congress, Space Station Freedom. And for us to do that job, we need stability in funding.

DEFERRED MAINTENANCE/MAJOR CONSTRUCTION

Senator MIKULSKI. My time is about up. Before I turn to Senator Gramm—and I'll be coming back to this—could we take just a minute or two to talk about the backlog of deferred maintenance and the major construction within NASA.

Could you tell us, first of all, what is the nature of it and how much of it could be funded out of the 1990 request? What, if anything, did OMB cut from the request in this area?

Because when I was at Lewis, for example, there was a tremendous asbestos problem, and we've got to make sure our astronauts breathe right on the shuttle and on the station and that our ground workers breathe right at Lewis and Ames and all those other places.

Admiral TRULY. If I may, I'll ask Mr. Campbell here to provide a more detailed answer. But you do touch on a very important point. People may have the impression that the Administrator and Deputy Administrator of NASA continue to sit around the table and talk about Galileo and Hubble and space shuttles and space stations. And, in fact, there's a lot of our time that we talk about aging facilities, near accidents that we've had at the centers because of steam plants, because some of our facilities are quite old. Ames just had its 50th anniversary this past year. Langley is significantly older than that. So facilities maintenance is very high priority and it is supported very strongly in this budget.

Senator MIKULSKI. Can we just move on quickly, because I want to move to my two colleagues.

Could you tell me how much of the deferred maintenance can be funded in 1990, and what, if anything, did OMB cut from your request in this area?

Mr. CAMPBELL. In the R&PM area, we have a concentrated effort to fund the deferred maintenance programs. We have $107 million in the fiscal year 1991 request. At OMB, we lost about $28 million of that request. But the funding level that we achieved at OMB for fiscal year 1991 and that we have an agreement with OMB to fund in 1992, will substantially increase funding for our maintenance program over the next 2 years above the fiscal year 1989 budget level. Madam Chair, the fiscal years 1991 and 1992 maintenance levels will almost double. So we're really focused on that and we have a very intensive assessment going on at the centers. And our intention is to meet the requirements.

Senator MIKULSKI. How much did OMB cut?

Mr. CAMPBELL. About $30 million.

Senator MIKULSKI. I know you're dealing intensively with inventory. Is that inventory complete, yet?

Mr. CAMPBELL. It's approaching completion. I think it will be ready in a month or two.

Senator MIKULSKI. We need it before a month, because it is now May 4. On or about June 15, we hope to be doing our markup. We really need your report by the fourth, or as close to it as you can. If you say a month or two, then you're going to lose us there. I mean, this is the Appropriations Committee; we're not the Budget Committee. We've got to do it this year. [Laughter.]

Now, my old arch friend here from the Budget Committee, Senator Gramm.

SPACE STATION FUNDING

Senator GRAMM. Thank you, Madam Chair.

Admiral Truly, let me first ask about the space station. I guess the last time that we got our full funding request, that is, the request the President made for the space station, was in 1987. Since that time, we've had some fairly sharp falloff in terms of, I don't know what happens as you go to OMB; I just know what happens when the budget comes from the President to Congress. Last year, we lost about a quarter of a billion dollars in terms of approved funding for the space station.

Where are we on the space station? And when you lose that kind of money, how do you deal with it? Do you slip the schedule? Do you cut back on capabilities? Basically, what is the impact of this loss? I guess, if we go back to 1986, you're probably talking about $0.5 billion that we've lost on the space station, that you requested.

Admiral TRULY. I would like Dr. Lenoir to step to the table, because he's directly responsible.

But let me say that this funding seesaw that the space station has been on is the direct cause, I think, of a lot of the turmoil that we've seen, both within our configuration and our attempts to deal with our international partners, who are also providing a significant resource. You mentioned the loss, last year, of one-quarter of a billion dollars. Frankly, as I know you'll recall, we had to fight very hard last year to keep that from being $0.5 billion. And that caused a tremendous upheaval in the program, but that upheaval was unavoidable because of the situation.

Dr. LENOIR. The cut over the years obviously has stretched out the schedule on the space station. Whereas we were earlier talking about bringing it to fruition in the early to mid-1990's, we're now talking about beginning construction in the mid-1990's and ending in the late 1990's. So that's the first effect of that.

Senator GRAMM. Let me just stop you there, if I may.

So if you were going to try to allocate in just general broad percentages, how much of the cut in funding has resulted in stretching out the program versus revising the program, would you guess?

Dr. LENOIR. Well, it comes in phases. Until last year, most of it was spent in rescheduling the program. Last year, we took a different tack which was to get inside and try to hold the schedule. But prior to last year, I believe, most of the cut manifested itself in schedule slippage.

Senator GRAMM. All right.

What have you done in terms of, as you call it, getting inside and looking at things that might be dropped out?

Dr. LENOIR. We did that primarily within the last year. I would want to take issue with one word, and that is that we didn't want to drop them out; we felt that we had to, that we had no choice. We went in and tried to find content that could be eliminated and still leave the basic space station with its basic capabilities, with perhaps some loss in efficiency, increased operating costs in the long term, and perhaps some increased runout costs. We tried to minimize that. In order to cut the fiscal year 1990 numbers and beyond, we had to take some of those penalties.

We cut three big areas. First, we eliminated the development of a new spacesuit which we felt was nice to have, but not required; that took about $350 million out. We changed the propulsion from a more advanced hydrogen/oxygen system that was also going to be more difficult to assemble, and we changed it to a state-of-the-art hydrazine system with modular replacement, easier assembly but poor logistics in the long term. And then we also made some content changes within the program itself.

INTERNATIONAL PARTICIPATION—SPACE STATION

Senator **Gramm**. Admiral, let me ask you a question. Forgive my lack of detailed knowledge of it.

But give me a burst transmission on foreign participation in the space station. How many countries? What are they doing on construction? How much do we value that in terms of what we're spending on the overall station?

Admiral **Truly**. You said space shuttle or space station?

Senator **Gramm**. Space station, excuse me.

Admiral **Truly**. The international participation in the space station is absolutely crucial. We have a partnership with Europe, the European Space Agency, a partnership with Canada, and a partnership with Japan, where they are providing significant resources. I'll leave it to Bill to try to describe, to give you a percentage.

But, as a matter of fact, I'm traveling to Canada early next week. We continually send our senior people and our engineers to these countries as we deal with the construction problem. They also are having some problems, particularly in Europe with the situation there, with their funding. But the station is not a U.S. station, alone; it is an international space station and has been that from its first conception.

Dr. **Lenoir**. You'll have to pardon me because I forget what year, but in round numbers, the total international participation is about $8 billion. That must be a couple of years old dollars.

Senator **Gramm**. What percentage would that be of what we perceive as the overall total?

Dr. **Lenoir**. It should be in the 25-percent range.

Senator **Gramm**. Has any thought been given, Admiral, maybe to casting that net again and see if in the ensuing period there hasn't been the emergence of a few countries that might be interested in becoming part of what we're doing? I mean, I think that a country like Korea, for example, that now has the ninth largest economy in the world, strong nationalism and pride, probably if approached right, might be interested in taking up part of this burden and also sharing in the achievement.

And, as we look at our finances, has any thought been given to try and reach out further than we have, or do we consider the set closed?

Admiral **Truly**. In the long term, I certainly don't consider it closed. But in the short term, we're in a buildup phase in the development of the station with partners, and we have international agreements, technical agreements, agreements as to what each will provide, working with requirements on power and so forth.

Frankly, I would think in the Space Station Freedom development as it stands here in 1990 and as we stand justifying the 1991 budget request, I think the fastest way to get this international space station would not be to look for that sort of participation today. But in the longer term, the world is changing in the space business and it's going to become more and more important for us to look literally globally as we do new programs.

Senator **Gramm**. I think that's important, especially if we are going back in Bill's phrase, to get back inside the space station. We're looking at a function that, because of budgetary reasons, that we're thinking of cutting out. And as I remember from my last tour at the Johnson Space Center, basically what we have done is taken various parts of the space station and we're having other countries in partnership with us take over those functions.

What I'm proposing is that at least some thought be given to the fact that we have a certain design requirement sitting there and we're thinking about dropping it because Congress is not willing to pay for it. One of the options that we would have would be to cast the net out and see if there is any country that would like to come in and pick up that cost.

I don't know to what extent we're bound by the agreements we've made to make it a closed set, but I think that clearly in the future we need to be looking, because there are a lot of countries that now have emerged with major economic resources that up to this point have been totally uninvolved and that might now want to be. And if we have some facet of the space station that we decide, after this budget—now, don't get me wrong, I hope we provide full funding and I will vote for it, but if we don't and you've got some well-defined function you just decided it was nice to have and you need it but you can't afford it, I'd like to see you at least look at the possibility of shopping around some of the countries in the world that didn't quite make the first cut but that might be interested, even at this late date, coming in.

Dr. **Lenoir**. If I might, Senator? We are doing exactly that. Not with a new country but with the Italian Space Agency who have approached us about, perhaps, providing some of the capability that we scrubbed out over the past year. We're in the middle of negotiations with them looking at potentially having a new agreement, bilateral between the United States and Italy where, not only as part of the European contribution but as a unique part of their own contribution, they would join the program.

Senator **Gramm**. I think that's good, and I want to commend you for doing that. And I want to urge you to look at doing more of it because obviously the more international participation we can get, the faster we can move ahead and the more we can do. I think that's very important.

Thank you, Madam Chair.

Senator **Mikulski**. You are quite welcome, Senator. That was a very informative line of questioning, and helpful to the Committee.

Senator Kerrey?

Senator **Kerrey**. Thank you, Madam Chair.

EXPLORATION PROGRAM

Admiral, I want to take a slightly different direction in my questioning. I appreciate the difficulties that you're going to have, and I think they are apt to be not dissimilar from other agencies of Government over the next half a dozen months as a consequence of deficit negotiations. I personally believe that our space program has provided the United States with not only an economic edge, a technical edge, but even morte importantly, it has kindled amongst the American people an enthusiasm for just pure exploration and discovery.

There are two issues I'd just mention briefly that concern me. The first is this barrier that exists between the big science project—whether it's one like the space station that Senator Gramm was referencing, or the superconducting super collider of the Department of Energy, or even the Hubble Telescope—and the little science efforts, and most importantly for me, even below the little science efforts, the general condition of math and science education in the country, which has been identified by the President and perhaps most eloquently by Admiral Watkins as something of great urgency for the Nation to address.

Quite frankly, I don't have much confidence in the Department of Education's ability to address it. Maybe it's because they tend to seem regulatory or an agency that essentially just disperses money. But, I've got a great deal of confidence in NASA's capacity to spark people's enthusiasm in the scientific effort.

DEFENSE/CIVILIAN ORIENTATION

The second issue that I think is increasingly going to be of concern for us in Congress is the very real problem of needing to move from a defense orientation into a civilian orientation.

I don't think it will come as a surprise to you to know that one of the first things that people think of when they think of civilian application is drug interdiction. Practically everything that sits out there that can be used in drug interdiction gets allocated immediately to the interdiction effort.

NASA'S PARTICIPATION WITH OTHER AGENCIES

I have questions about what NASA is doing with DARPA, what NASA is doing with the research labs that Admiral Watkins is looking at to see if that $3.7 billion, 75,000-person effort can be used somewhat differently, now that we may not need quite as much resources dedicated to the development of weapons. Recently, we deployed this over-the-horizon network that enables us essentially to track a 3 million square mile region from the northern part of South America over the Azores and Iceland, and discover if there are any Soviet planes flying over. Now, there may be little likelihood of that, but we're looking for some application. That's just another example of where it seems to me that we're going to have to make a concerted effort to make this transition from a military objective to a civilian one.

MATH, SCIENCE, AND ENGINEERING EDUCATION

And I think NASA can play a very important role in that.

I guess the first question I would ask is, What role does NASA have in the coordinating effort that Admiral Watkins is apparently chairing, concerning math, science, and engineering education? Are you participating in that?

Admiral Truly. Yes, I am.

First of all, let me thank you for mentioning your view that NASA can play an important role. I believe that's true, and I think it's shared by the President. When the President had his summit with the Governors in Charlottesville last fall, I attended that and

I was the only non-Cabinet officer of the agencies that did. And as a matter of fact, I know that was a recognition on the part of the President that NASA's education programs and the effect that we can have on young kids to excite them about literacy in math and science, can be very, very productive.

Admiral Watkins and I have talked for hours on this particular subject. He and Dr. Glenn Seborg, several months ago, held a conference out at the University of California at Berkeley, and I personally went out there and participated in that conference. I believe that NASA and the national labs together can, on the whole, be bigger than the sum of our parts for a very simple reason—the national labs are located geographically in different cities than our field centers. And the interest that Admiral Watkins has had in math and science education is one that NASA very much has been a part of.

I think that our programs in education are effective for a very simple reason, and this simple reason gives us a very big responsibility; that reason is that our programs—airplanes, spaceships, astronauts, planets, excitement, discovery—can get to kids. This is where the real math and science education in the younger people must start if there's a solution, it has to start with those younger grades so that we can stop scaring off young people from participating in this exciting part of American life.

This is a subject I feel strongly about. And the short answer to your question is that Secretary Watkins and I—DOE and NASA—will work very closely together.

PROGRESS IN MATH AND SCIENCE EDUCATION

Senator KERREY. I'm really worried about the progress that we're making. I must tell you that I don't think we're making much progress. The President's and the Governors' objective of being first in the world in math and science by the year 2000 is now about 3,400 days away, and I suspect we're still 17th among the 17 industrial nations, as we were when that goal was announced in Charlottesville.

I'm genuinely concerned that we have not mobilized an effort. What I picture out there are 16,000 school districts and I've got to tell you, I'm not only disappointed, I was angered at Secretary Cavazos' statement the other day. What he did was undercut not only citizens' enthusiasm but politicians' enthusiasm for fighting the battles, and they are major battles when you fight battles over school reform. I mean, it's not likely something that he did when he was at Texas Tech.

It clearly is not just more money. It clearly is going to require us really to think. I know that you've been working on it, and I'm pleased to hear that you're working with Admiral Watkins. I just urge you to follow that instinct. Because, as I said, I picture 16,000 school districts out there that are struggling to get math and science teachers and not able to do it adequately. It's hard today to hire someone at $24,000 a year who is really good in math and science; it's difficult particularly when they've got to teach six 50-minute periods a day with dysfunctional families producing children that are behind when they come into class, with problems that exist in 1990 that didn't exist in 1960.

We've got in addition to that, about 120 million households that are wired in, although the technology is more archaic than I would like, to 96-percent penetration with telephones, offering some I think potential if we think for a communications systems that might use the same kinds of technology that are used at NASA to do big science projects. We've got 16 supercomputers out of 24 that the Federal Government owns that are designing nuclear warheads. We know that we don't need that number for doing that for very much longer. And perhaps if we combine your thinking on such wonderful projects as Hubble and Secretary Watkins' thinking on what I think is a very exciting project, the superconductor super collider, both essentially doing the same thing at different ends of spectrum, we could come up with something that would give the people the tools that I think they need to explore math and science.

I urge you to follow those instincts and the urgency you feel, because I don't believe that the Federal Government is doing nearly enough to mobilize the American people.

As you know, I'm sure, we're increasingly having to turn outside of our borders to hire engineers, to hire Ph.D.'s in math and science.

It just seems to me both for competitive reasons but also for reasons of just wanting mankind to continue to advance, that we have to focus our attention on education. And I genuinely believe, by the way, that NASA's going to be a key because you've put Hubble up there, you've had Voyager. That's all very exciting.

I'd appreciate any comments that you might have to what's a very long statement.

Admiral TRULY. I'll be very brief. I'm following those instincts as best I can. As a matter of fact, I'm pushing and pulling my already excellent education people across NASA to try and get more leverage, to get anything. I would like to get NASA information about our space programs into every one of those 16,000 school districts. To do that, we're going to have to be very innovative with our leverage programs, and NASA select television, for example. As a matter of fact, today, and we are doing things. Today, right down the street in front of our building, is an 18-wheeler truck called Learning About Science, Engineering, and Research [LASER], that is designed to drive around this country, targeted not at students and not at parents, but at teachers, so that they can come through this and coordinate it with the school districts as they go in.

And that's just one of like 160 programs that we have.

PRODUCTION OF MATH AND SCIENCE TEACHERS

Senator KERREY. Incidentally, I have a bill that I just introduced—I'll get you a copy, and I'd appreciate any comments you could give me on it. It essentially is a math and science effort that uses NASA entirely to try to improve the production of math and science teachers, and to improve the quality of our students' performance in a number of other areas.

Admiral TRULY. I would appreciate that opportunity, Senator.

Let me also ask you to tune in to the next space shuttle, the Astro-1 spacelab mission, in just about 2 weeks because as part of one of our education programs, it is designed precisely to excite kids. We're going to conduct a classroom from space with the astronauts as the teachers in the space shuttle, and students on Earth asking them questions and interacting with them. We're trying to make a difference and we're going to continue to try.

Senator KERREY. Let me make it clear, now that I'm over the line in time, let me make it clear that my enthusiasm for NASA has nothing to do with the military functions that you perform for DOD. I'm excited by Voyager, by Hubble. Even the economic applications, although I know they're going to be there, don't enthuse me as much as just the raw exploration, seeing things that we didn't know were out there. That is a "for your information," so you know why I'm enthusiastic about NASA.

Admiral TRULY. Thank you, Senator.

SCIENCE EDUCATION

Senator MIKULSKI. Thank you, Senator Kerrey, very much for raising these education questions. We also know that you've introduced legislation to enable NASA to have a more prominent role in education.

These are conversations I'd like to have with my own subcommittee with NASA, EPA, and the National Science Foundation. In some ways these agencies are the education agencies, and there are many interesting things we can talk about.

One-third of NASA employees, I believe, will be eligible for retirement within the next 4 to 5 years. This is the gang that came in in the early NASA days. They would make a wonderful group of men and women who could go to our schools and we could really develop alternative certification programs. For the $25,000 that we can pay a science teacher, it might be very hard to recruit a young researcher, but we could certainly take many of the wonderful people who've had years of experience and put them in the classroom. That would be No. 1.

If you didn't put them in the classroom, we need to retool our teachers. Most of the elementary schoolteachers have not had more than one science course in their entire undergraduate education, so we need to get the elementary teachers ready to be able to teach science.

In our own way, we're trying to do a certain level of consciousness raising here. NASA is working in the field of education. I know it's a subject we'd like to talk more about. Senator, it's my intention that after we've completed our appropriations later in the summer, that we'll have a separate hearing on educational issues in those individual agencies. And kind of go through and hear what EPA's got to say and NASA and so on, and just focus on that.

Senator, do you have any other questions?

Senator KERREY. I have a list here that I would just submit for answering later, Madam Chair, that I don't need to go into now.

EARTH OBSERVING SYSTEM/MOON-MARS INITIATIVE

Senator MIKULSKI. Admiral Truly, we've covered a lot of ground, and I want to come, if I could in the next 20 minutes that we have together, again to some of the hard choices.

I'd like to come back now to the Earth observing system and the Moon-Mars program. Of the two new starts that you requested in 1991, what would you consider to be the most important in providing us with the most important scientific information? If we had to choose only one of them, what would you recommend?

Admiral TRULY. I would recommend that you not choose totally between one or the other. The reason that I say this is the following: They are two very very different initiatives. In the case of the Mission to Planet Earth, it's something we have to do. Whether we have to do it in fiscal year 1991 at a certain level or whether we can't afford to start it until later, I think that we on this Earth have no choice but to develop a database to better understand the interactions between the land, the oceans, the ice, and the atmosphere. Because in the last several decades, in addition to those forces, you and I and the others on this planet have become of such an importance that we are literally endangering our home.

Therefore, we have put together a program that is well laid out. It is small in the Earth probes where we can do individual satellite monitoring of the Earth; and it is large in the Earth observing system where, for good scientific reasons, reviewed by the National Academy, we have to put a number of instruments on a single platform. Therefore, it's a larger program than the Earth probes. So I think even though 98 percent of our budget goes for the core that I mentioned, I believe that at some level, it would be your choice, that you decide to invest in it.

The Moon-Mars effort is a very different program. We're not asking for a new start. We do not have a program designed. It's a vision of the next century as to what this Nation, and, frankly, I believe all the space-faring nations or many of them, are going to choose as a discovery program of the 21st century. We're not asking for dollars for a new start. What we are asking for is a small amount of money, about $188 million, to start those very focused technology efforts so that we can come back to the Congress in the future with a well laidout program. It will be expensive but it will be most cost-effective if we can go about it in a very rational way.

I would recommend strongly that when choices have to be made that they're not binary, either one or the other.

Let me also point out one thing about technology. Whether it's the technology programs that we're asking for in the exploration effort, whether it's in our civil space technology initiative, or other parts of our research efforts, I find it frankly very odd and troubling that all year long, over and over, we talk about American competitiveness, but when we fight for our integrated budgets, those technology line items, at budget time, are cut. There is a direct connection between the investment in technology and American competitiveness. Not a dime of that money is going to get spent on Mars. It's going to get spent within NASA research centers with NASA contractors to do focus studies with American universities doing in some cases really far out and, in some cases, very basic research.

So I appreciate the difficulties that this committee and the Congress have with priorities, but I would urge that when those choices are made, they not be a binary, one-zero choice. Both of those programs, I think, are most important.

Senator **Mikulski**. I know why you're an admiral now. [Laughter.]

SPACE STATION PROBLEMS

In terms of staying the course here, it's 11:20 and so far, we haven't had one recommendation so far of where we could cut, Admiral. Don't take a nickel out of personnel, don't take a nickel out of space station, space shuttle, and, of course, funds for Moon-Mars and the Mission to Planet Earth, which means that the choices probably will come to the Congress, which then takes us to the space station.

You went through a pretty tough set of paces over there in the House on the space station. And we have some of the same questions. But let me get exactly the point that I want to discuss with you.

We hear all kinds of things about the cost overruns of the space station. The fact that it is going to be mega-money to operate it, to maintain it. Lots of shuttle missions to go up there and replace multimicrochips and so on.

Could you tell us about the station? Could you comment on the criticisms of the station, that vital parts will start failing before completion of the project, that today a total of 31 space shuttle flights are planned to do the maintenance. It goes on and on and on. But that internal reports within your own agency that are public in a society like ours say that the station needs major repairs, new design and that Freedom would be two-thirds completed and be required to take 2,200 hours a year of space flight simply to replace parts expected to fail on the station's exterior. And I could go on.

Would you comment on this? Because the way we read it is that if you have a space station which has already been redesigned several times, and it gets up there, instead of astronauts walking on the Moon, they're going to be walking around fixing this station, and that it's going to take an enormous amount of our resources just to keep it flying.

Admiral **Truly**. In the interests of time, if I might ask Dr. Lenoir to comment for you, I would like to do that.

Dr. **Lenoir**. Let me first say that the timing of all of the recent newspaper articles, I think, has been very unfortunate, in that they look into the middle of a study that's going on, and take very preliminary data and present it as though it was the final answer.

The study that was commissioned by myself and Dick Kohrs, the Space Station Program Director, was hardly intended to sweep the problem under the rug. It was intended to make sure we understood it as a part, frankly, of our normal preliminary design process.

We asked the committee that's headed by Bill Fisher and Charles Price to help us do this study. They had three steps they would perform. One was to make sure that they had looked at all of what we call orbital replacement units, the pieces that could be maintained and replaced in orbit, make sure that we understood all of the units that might need maintenance, and estimate how much that maintenance might be. That's the first step, and they're in the middle of that.

The second step is to go back and challenge that. We want to make sure we don't leave anything out or forget anything; we want to get all the possible candidates on the table. And we know some of them won't be real. As we have tested some of the early numbers, we find that they get smaller. We find that Bill Fisher and Charles Price had an estimating factor that estimated inefficiencies and inaccuracies in their numbers. They multiplied their original estimate by four. In one case, we found a fairly large contributor to that; the contractor behind the original estimate had already multiplied it by three because he wasn't sure, either. And we know that there's a lot of that in there.

REPLACING SOLAR BLANKETS

With respect to the solar blankets, for example, on the Canadian manipulator arm, they initially estimated we would need to change them once a year due to atomic oxygen impingement. We know from our solar maximum mission experience and from our LDEF experience, that atomic oxygen does indeed degrade materials, but not to that extent. And we've learned enough that we can design them properly and that we don't anticipate replacing thermal blankets once a year. Maybe it's once every 5 years or once every 10 years. But that's where we are, and that will divide that number, which was substantial, by 5 or by 10.

As the third step, we find that there's what we call 20 percent of the units that are the "greedy" units, the ones that drive requirements for 80 percent of the space walk and space time. The point is, we're in the middle of that study and that is intended to look at all the potentials. And then what we want to do is test it and we want to push on the engineers, making sure that there's substance behind that, and identify the key drivers.

Then with respect to the key drivers that require the most space time, we will see if we could do them robotically instead of with man. We have recently baselined a whole series of assembly tasks that the flight telerobotic servicer will do as prime.

Second, we will spend time on a more likely design, more reliable, less likely to fail. We will also be spending some money making the EVA more efficient. Finally, if appropriate, we can design that particular units are placed inside, not outside.

This is all part of our normal preliminary design process that will come to culmination in the December timeframe with our program preliminary design review. We have allocated funding to cover changes that will be driven by the design review itself. And we think we're on schedule and on budget.

UNANTICIPATED STATION PROBLEMS

Senator **Mikulski**. Dr. Lenoir, I appreciate those comments. One of the concerns this committee has is the unanticipated station problems. We know that we're not in a risk free society or a risk free program, or that every assumption or prediction is an accurate one. But I'm concerned that, every time we turn around, there's an additional surprise problem that damages the station's credibility and drives up the cost. For example, GAO has said that NASA significantly underrated threats from space debris. Another example is the computer system called the TMIS which has simply not been used by either the NASA centers or the contractors. That was just a few days ago in Space News.

Now, I think we have excellent communications with NASA and I'm not saying that I get my stuff from Space News. But in the committee, we feel that every time we pick up a trade paper or a major paper, there's something that wasn't anticipated.

My question would be, What are you doing to tackle these problems—and I think you went into that—and are there any other potential problems we need to be aware of, so that the committee is aware of them, and not just getting headlines that cause us to shake our heads?

Dr. **Lenoir**. Madam Chair, we are as frustrated as I believe you are in this. And I believe much of it is communications. Perhaps we're not communicating as effectively as we should. The orbital debris problem we're aware of. We have been working. We have a requirement in the space station that they need to shield themselves to a certain level. And we have a program going on that will test whether we have the right level. We think we do. We don't want to have too much shielding or we will spend a lot of money for weight. We certainly don't want to have too little and be unsafe. It's incumbent upon us to be as accurate as we can as soon as we can, so that we don't drive costs laden with changes.

TECHNICAL MANAGEMENT INFORMATION SYSTEM

On the Technical Management Information System [TMIS], we believe that what was said by the Aerospace Safety Advisory Panel report isn't entirely accurate. We would invite you and the other members and staff over to NASA, either NASA headquarters, or Reston or Goddard, wherever appropriate; they're all tied in together on that same system. We'd be very happy to give you a demonstration and show you how TMIS is used in a management sense and how it's used in a technical sense.

There are other things. We are in the preliminary design phase of the program. That's a very tough phase because that's where we try to make the transition from a paper concept definition of how it all works to a more detailed engineering design. And we know that we'll run into places where we have square pegs in round holes. That's what the design review is about, to identify those problems early and decide whether to round the peg or square out the hole. We have those. The resource areas that we have been following for a year now include the EVA, power allocations, and weight.

SPACE STATION CURRENT BUDGET/LIFE CYCLE COST

Senator **Mikulski**. Doctor, let me get right into this, then, because time is getting short. What, then, would you say is the space station's current budget and life cycle cost, and how does that compare with last year's estimate?

Dr. **Lenoir**. Again, in December, we will have a much better estimate. Currently, our estimate would be about the same as last year. We believe it may be even a little bit less, somewhere in the $1.5 billion range per year for operating costs, and I believe those are 1987 dollars, and that's consistent, I believe, with our projections since then.

Senator **Mikulski**. Is that right?

Mr. **Campbell**. Dr. Lenoir, you are addressing largely the operations costs. We have furnished the runout development and operations costs through 1999 at about $30 billion.

Dr. **Lenoir**. I was talking the annual costs.

Senator **Mikulski**. No, no; this committee moves to life cycle. That's one of the things when I took over the committee chairmanship, that's how we always quite frankly end up with pretty significant underestimates, and really thank you for moving to life cycle. Because, as I understand, you estimate $38 billion, which is substantially over last year.

Am I right, Mr. Comptroller?

Mr. **Campbell**. It's several billion over last year. But the reason is because we increased the number of years. We extended it until 1999 to cover the permanent manned capability and to carry it through to assembly complete.

Dr. **Lenoir**. Incidentally, in the December timeframe that I keep mentioning, will be the completion of our preliminary design review where we will have a whole new generation of data that is more accurate.

EARTH OBSERVING SYSTEM

Senator **Mikulski**. Since you've transferred the EOS platform out of the station program, which reduced the station's budget for this cycle by almost $1 billion, so you took $1 billion cost out. But then you're saying that you also have a $1 billion increase. So really then we're talking about a $2 or $3 billion increase; am I right?

Mr. **Campbell**. Yes; in that sense. We moved about $700 million out into the science budget. Because of the change in the program elements due to rephasing adjustments of last year, we recognized we increased risk to the program, Madam Chair, and, therefore, the reserve elements, the contingency to offset the risk, was increased over $1 billion; actually, my memory is that it was $1.3 billion. Then there were a lot of other adjustments within the other accounts, but our major increase was in operations where we extended the timeframe by about 2 years.

Senator **Mikulski**. I'm not unsympathetic or critical. I just want to get at the real dollars. Just as NASA is dealing with deferred maintenance, I've got to deal with deferred budgeting, as I go through my accounts that NASA and other agencies within this 302(b) have used deferred or stretched-out gimmicks. We even used gimmicks last year to get you through, but all of those were deferrals.

The problem with a deferral is in the very nature of the deferral in that it comes due. We have in the subcommittee a lot of bills coming due over the past few years. And then it is true, you reevaluate and redesign, so that we don't have an Edsel of a space program. I mean, we understand that. But this is what I'm trying to get at; which is the real cost?

I've got a question on the space shuttle and also on management.

But, Senator Kerry, would you like to ask a question?

MOON-MARS INITIATIVE

Senator **Kerrey**. Thank you, Madam Chair.

I have an additional question. This, again, has to do with some of the new initiatives, particularly the Moon-Mars initiative.

When the Chair asked you about that, Admiral, you talked about it as sort of minimalized the whole thing, that's in an early effort and you're just doing some preliminary work on it.

But that's not really how it was sold to the people. Now, maybe the President needed to have something new and exciting to give a speech about, so he described this new Moon-Mars initiative. But he talked about it as if we're going to Mars. He's out there selling it to the American people that we've got this exciting new Moon-Mars initiative and generating enthusiasm for it.

Unfortunately, there's no money for it; certainly no money in the outyears for it, given what forecasts we've got in place, unless he changes his line on new taxes. We're already some $50 or $60 billion short right now, and we're borrowing 20 percent of everything that we pay for right now.

So it seems to me that what we've got is this exciting, as you describe it, the President provided a focus which will guide this Nation's space efforts for decades. I quite disagree with you. I don't think that's a focus at all. I think it's a photo opportunity and an opportunity to describe something that's exciting. And it's dangerous in many ways because people get excited about it, and then we don't have the money for it, and have to cut other things that are already established and are working.,

I'd just appreciate it if you'd address what I think Madam Chair was trying to get at. And that is, Are we kidding ourselves? Are we starting something new without considering that at some point, it gets expensive and we don't have money to do it?

Admiral **Truly**. Senator, I certainly didn't mean, in my answer to the Chair, to minimize the magnitude of the exploration program. It is going to be a very large program in the next century.

What I wanted to do, though, was to point out that before our commitment is made to those large outyear budgets, we need to define ways that we can look for technologies that can make the costs cheaper and to make the program more effective. And, therefore, those early requests are not large. Of the $15.2 billion request, $188 million that's on this table is that small amount.

I did not intend to trivialize the difficulty of such a mission.

Senator **Kerrey**. I think if we lock this thing in, if we provide this level of funding without thinking about what the outyear expenditures are going to be, it's got the potential to devour every other thing that you're doing, unless we commit ourselves today to doubling or tripling NASA's budget.

Maybe the President's willing to commit to do that in 1997, but I don't hear him being willing to do that in 1991. I hear him go up and declare an exciting new space initiative in one breath and then go in and talk to the chamber of commerce and say, "No new taxes."

It seems to me that it's not just a simple matter of desiring to have some exciting new initiative out there. That it could potentially be, if we said yes to it without considering what it's going to cost us, it could potentially be something that hurts NASA in the long run because we aren't serious about fully funding it. It seems to me that if we aren't serious about fully funding it, we should say so. And it seems to me that that, in fact, is the case. We are not serious about fully funding this lunar Mars program at all.

Admiral **Truly**. If I might add, I believe it would be very inaccurate to characterize the President's interest in investing in the future with such a program as a photo opportunity or just a speech. The President just this week had a discussion with the Speaker of the House and the leadership of the Senate and the chairs of our various committees on this very issue of focusing and investing in the future of the country in science and technology, and he believes it, as do the others on his staff, the Science Advisor and the Vice President and Chair of the Space Council.

PRESIDENT'S NEW INITIATIVES

Senator **Kerrey**. Admiral, we ran $150 billion budget deficit the first 6 months of this fiscal year. Now, the President in January said, we've got this deficit under control. We were supposed to have it at $100 billion for the full 12 months. We're back in the world of the $200 billion deficit.

You can talk all you want to about being serious about this program, but the fiscal realities don't permit it. The President is committed, and I think the Congress is behind him, in avoiding new taxes. And with that as a given, and the amount of borrowing we're already doing, Admiral, it seems to me that one of the things that we've got to be careful of doing in understanding the need of the President to describe new initiatives, is sort of paradoxically, Congress is going to have to rein him in a little bit and say, we can't afford this, Mr. President. We know you want to do it, but you don't want to pay for it.

We've got other things we've got to fund here, and we're going to have to restore some fiscal discipline to this at some point. Otherwise, it seems to me, we're going to be clear off the charts.

Admiral **Truly**. I guess my only comment is that, in view of this conversation and others, we certainly are having that debate today. It is a very large program, but that's precisely the reason that the President asked not for a new start for the program but for the money to define it, so that that debate can go forward.

SHUTTLE DELAYS—AUXILIARY POWER UNITS

Senator **MIKULSKI**. I want to come back to something that whether we go to the Moon or keep Hubble from having the jitters, and that is shuttle reliability. In the recent *Discovery* flight, the auxiliary power units [APU's] have caused problems or delays, and have on about 11 percent of all flights. Can we talk about what's being done to reduce those delays and what would it cost to do so. That goes back to funding the core program and so on.

Could you comment on that, Admiral, because I know it's a major concern with you.

Admiral **TRULY**. It most certainly is. We are investing a significant amount of money in increasing the margins in the shuttle system, and also investing in those things that allow us to increase the probability of lifting off on a particular day. In the final analysis, however, the shuttle is a very complicated system and the APU's that you've just mentioned are an absolutely critical part of that system. As a matter of fact, on my first flight, on STS-2 in November 1981, I sat out on the pad for 6 hours because of an APU problem.

But the simple fact is, even after we invest the moneys to increase the reliabilities and the probability of launch on a certain date, I think we can show you in great detail those records of how we've done and I'm very proud of them. When an APU fails that close in, that's the day to quit and go change it and try again another day.

We have shown in the program that we're quite willing, even with large crowds watching and crews very anxious to fly, there are some days that you need to back away.

However, I would say that our investments in safety and reliability are very balanced. It continues to be a risky business; we're trying to define the parts in reducing that risk. Again, on the auxiliary power unit, let me give you an example. This past flight in which we flew the Hubble Space Telescope, we had a new turbine wheel in the APU that is a result of several years of NASA development in order to get around the problem of microscopic cracking in the turbine blades. So I think our program is a very balanced one. We're going to continue to fight for the funds to keep it that way.

SPACE SHUTTLE PROGRAM RISK

Senator **MIKULSKI**. This, then, takes me to the question of safety, the safety of our astronauts which is crucial. NASA has an Aerospace Safety Advisory Panel. They've just come out with this report, and they express concern that there are risks to the shuttle program, that if these risks are not further reduced, that a space shuttle accident will most likely occur. The panel specifically cites deferral of improvements in the space shuttle main engines.

Do you disagree with the safety panel's comments? And what would you like to comment in terms of this report?

Admiral **TRULY**. First, let me say for the record that that safety panel is one that I respect, one that is made up of people that come out of industry and some that have been in NASA before. We take them extremely seriously.

I met with J.R. Thompson and with Bill Lenoir privately with that panel before they issued that report. The simple answer to your question is, "Yes and no."

There are cases in that report where they have opinions that we disagree with. However, there are also cases where we are presently undertaking action to implement accommodations. As a matter of fact, this afternoon after we have this hearing, I'm going back to NASA headquarters and I'm going to sit down with the three of us here at the front table. And we plan to go recommendation by recommendation, so that we can professionally answer their arguments.

When we talked to them, their principal gripe was that the changes take too long. And I agree with that.

SPACE SHUTTLE MAIN ENGINE PROBLEM

Senator MIKULSKI. Admiral, in the time that we have, could we go to the main engine problem here? Because it is the power issue that they raised most specifically. We're glad you're going to go through it recommendation by recommendation. Could we deal with that? Because in the budget request, sir, that's where there's a $7 million cut. Again, we want to make sure that we're not cutting needed safety. Would you comment on the main engine issue, the issue that they raised on the main engine?

Dr. LENOIR. With respect to the main engine enhancements that they're discussing, we think we're developing them as fast as we reasonably can. The finances are not that large an issue. If we poured a lot more money on it, it might advance the readiness a little bit, but not a lot.

We've found, as frequently happens in advanced technology developments, that it has taken longer to bring the technologies along. We have a limited ability to test them, and because they are critical components of our very critical main engines to the shuttle, we must be absolutely certain that we have verified that they have operated as they should and have not introduced some unintended failure mode. So we must extensively test that. All that takes time, and we trade off our test stands for one enhancement versus another, in order to bring them on line as quickly as we can.

Mr. THOMPSON. Let me just add to that, since I've got some personal knowledge. I managed that program for some 7 or 8 years, and I'm well aware of some of its shortcomings.

On the lack of margins that we've got, I think in general we have no disagreement with the thrust of the Safety Advisory Committee's report. We are putting a lot of money in it. It's the most improved system on the shuttle since we started flying in April 1981. We do have a concern that for any change we put in, we can be sure that it's thoroughly qualified and verified. And I believe we're on that track, for example, with the advanced turbo machinery. It is a high ticket, big expense item in our budgets for the next several years. And I believe by the late 1993 or early 1994 timeframe, that we will be incorporating those turbo machine parts in the shuttle main engine flights continuously.

There are other changes that are planned. We have other parts being tested down at Huntsville now on an experimental basis. I believe, with time, once we convince ourselves that we're going forward and not backward, that we'll be addressing with the committee the changes we want to make. Because we are putting a lot of money in the improvements of the shuttle main engine today.

Senator **Mikulski**. Do you feel satisfied that that's moving on track?

Mr. **Thompson**. I feel very satisfied that we're doing the right thing, attacking the right areas, and that we've got the right systems in place to make sure that we're going to end up with a good product. I would always love it faster, and certainly, that's the case.

Senator **Mikulski**. But there are many exciting shuttle missions planned between now and 1993 before the adaptations or improvements or enhancements are made. The question then becomes, the issues that they raise about the main engine risks, raised the question are we safe in flying at this time?

Mr. **Thompson**. I believe we are. Through the last flight, we have successfully sent into orbit safely 105 main engines. Obviously, we've done that with a lot of care, a lot of attention. We're up high on every flight and I believe through the next decade we're going to stay that way with what we're flying today. Even after we bring those improvements in, in my judgment, even with the solid motor, the main engine is the most critical part of the whole system.

SHUTTLE SAFETY

Senator **Mikulski**. I've talked with you. I don't know Dr. Lenoir as well as I know you and Admiral Truly. I know you're men of honor and I know your commitment to the safety of the astronauts. You don't need a pep talk from me.

I would just pledge to you this committee's assistance in anything we can do to ensure the safety of our men and women in space. Also, when it comes to reliability, reliability is not only a technology, it's management decisions. You make those right decisions; you make those proven decisions. We're not in the moviemaking business or whatever, and we have confidence in you, because I know your deep personal commitment. We place that back with you.

It's one thing to talk about missions, but we have people whose lives are in our hands, and we're with you on that.

DATA MANAGEMENT

Let me move, to wrap up, onto something that is related to the core of many of our scientific missions, which is data management. We have a GAO report, Admiral Truly, that is not complimentary of the data management practices at NASA. In fact, the GAO report says NASA is not properly safeguarding valuable data from past missions. I'm sure you've read the report; it's critical of the management of the magnetic computer tapes. GAO says that NASA is taking unacceptable risks with 40 percent of the 1.2 million computer magnetic tapes that are in its archives. And it says that NASA cannot meet the needs for Mission to Planet Earth and Hubble Space Telescope unless the data management is improved.

Then they give several recommendations, both technical and management.

Could you then tell us what actions you are taking on these GAO recommendations, both technical and management?

Admiral **Truly**. If I could, I'd like Dr. Fisk to go through those with you. But let me first say that we take strong exception to portions of that particular report, exceptions that I've already put on the public record. I think NASA's record in data management is one to be admired. It's a very very complex and difficult problem and therefore we're never perfect and we certainly don't claim to be.

Dr. Fisk?

Dr. **Fisk**. Thank you.

Let me just emphasize that point, and then I'll be specific about the things that are coming up. There is not evidence in that report which can be verified or that we are aware of that documents any loss of data by NASA that is important to the science community. In fact, there are some statements in there which are inaccurate and we've pointed that out in our response, which will be coming up to the Congress in the next few weeks.

As for the upcoming projects——

LOSS OF DATA INFORMATION

Senator **Mikulski**. Excuse me. I have the report. This is not meant to debate or refute. I don't need to tell you the information that we have here. For example, these pictures. One shows tapes likely to be damaged by flooding, electric heaters in close proximity to stored tapes. We're not talking about Don Henley and the Eagles, but your very high-tech tapes. If you put something next to heat, it tends to mess up the tapes. That's the kind of stuff we're talking about.

Dr. **Fisk**. Let me give you a very specific example. The report points out that we sent 130,000 tapes from the Jet Propulsion Laboratory to store in a facility in a place called Laguna Nadal. This was not a good move on our part; it was not a NASA facility. It was a facility under the auspices of the agency which is supposed to be responsible for archiving, the so-called NAR agency. Unfortunately, they don't abide by our standards. And a lot of those pictures came from that facility. The report claims that we've lost half the data. We took all the data back to JPL. We have read 30 percent of the tapes, and we have not lost a single bit.

Senator **Mikulski**. What about the other 70?

Dr. **Fisk**. We're reading them now. I have every reason to think that the statistics on the first 30 percent that we have read are representative of the total data set.

GAO RECOMMENDATIONS

Senator **Mikulski**. Again, we're not here to debate. I know that you've commented at the House Appropriations Committee on this issue. However, it is our understanding from GAO that you have not commented directly to GAO on their report; am I correct on that?

Dr. **Fisk**. We sent specific comments into the GAO that were published in the report by the normal procedures on this. We have a report; in fact, I read it yesterday. So NASA's response is working its way through the system now; that response provides chapter-and-verse comments on specific pictures and their inaccuracies, comments on specific tape issues, comments on the amount of tape loss which are inaccurate. Such specific replies are normally sent to the Congress in response to a report.

Senator **Mikulski**. I'm sorry, I misspoke. It's not that you didn't comment on their report; you didn't comment on the recommendations, which seem to be reasonable management practices: "Conduct a thorough inventory of the data, assess their scientific value, copy what's valuable and release what's unneeded for reuse or disposal, archive the data at the facilities at the National Archives," that's over here in Maryland, "develop appropriate standards for archiving, define management roles, periodic oversight." These are the kinds of management practices that are fairly basic.

Dr. **Fisk**. Yes. If I might turn to that issue, there are many things that NASA is doing these days; let me just cite a few of them which are not so much in response to the GAO recommendations, but things that we already had underway which would satisfy many of those recommendations. There is an inventory going on as we speak. There is a master directory being developed as we speak. We are in the process of converting from magnetic tapes to optical disks for many key data sets, particularly in the area of Earth science.

We actually don't disagree with the recommendations of the report because these are things that we think are important to do. And many of them are underway now. Our only concern with the report was the indictment of our past record.

You've mentioned, for example, the issue of Earth science, the Mission to Planet Earth, which is clearly going to be the biggest challenge that we will face. And, as you know, an enormous amount of attention is being paid to data handling in that project; we have directed the lion's share of the funding in the Earth observing system to the handling of the data in recognition of that challenge.

Senator **Mikulski**. Well, doctor, I'm going to come back to EOS in a second. But in terms of the GAO's technical and management recommendations, we would really like you to implement their recommendations, unless there is some reason why there wouldn't be a reason to do so. They just seem very straightforward. We know that this is a leadership that believes in good management and is trying to be meticulous about it. I know that that is also your management philosophy.

Dr. **Fisk**. Please rest assured that they are being implemented and in many cases, they've already been implemented.

CATALOGING OF DATA

Senator **Mikulski**. I'm going to go to a question on the Mission to Planet Earth which is, again, not only the accumulation of data, because I understand you're going to generate as much as 7,000 tapes a day. But we don't want to create a data mortuary and that's not what you're here to do.

My question then is, is the technology now established reasonably expected that it will permit the necessary cataloguing of the data stream, et cetera, and scientific analysis, or are we going to be boring into this ocean of data and essentially have a data mortuary?

Dr. FISK. We will not have a data mortuary. We are determined that will not be the case. The technology does exist but it's important to note that it really is recent advances in technology that make this possible. If we were using magnetic tapes for the storage of data, it would not be possible to do the EOS project. I believe the number is closer to 200,000 tapes a day that we would receive, if we were storing this on tapes. We are not. Fortunately, there have been major advances in optical disks and high-density storage media that make that a much more manageable number, in the hundreds of optical disks, as opposed to the hundreds of thousands of magnetic tapes.

Senator MIKULSKI. I know that they're making tremendous technological breakthroughs in the accumulation of data and also the simultaneous nature of the data. But then, from what data management experts tell the committee, nowhere do they see in the data management discussions, the technique of cataloging.

Now, cataloging is a very precise term; it's not like librarians where you put things together like, all the Louisa May Alcott's all over here and Nancy Drew over here, and so on. Cataloging is the way you set up streams of information based on user functions. There's concern that we're going to have all this data, and it's not like you could call it up if you go to the data management librarian at NASA and say, well, I want to know about the oceans of the Earth on October 4, they're not going to go through this.

Dr. FISK. If I may just give you two quick examples, to give you some reassurance.

The coastal zone color scanner [CZCS], which would require 28,000 magnetic tapes to look at, has been reduced to three small optical disks for browsing. So you send out three small optical disks and a scientist can browse through it to find the data he wants. Then they go back to look at the specific data to analyze. That's a technique which is very effective. It's sort of the equivalent of your card catalog analogy, except you're now browsing through an optical disk. The intention is to have those kinds of capabilities for the EOS data, so that there will be a browse capability for the scientists in a very condensed form so they can see what it is they want to go get, and then get it from the archives that are established around the country.

Senator MIKULSKI. Well, you're really here on the frontier in managing the vastest accumulation of data that any free society has ever undertaken. Because whatever we accumulate, we want to make it available to our scientists and researchers and the globalization of information in a very significant way. That's why we are really focused on making maximum use of this thing. As these projects unfold, we'll be talking with you about it, because it's not our intention to argue over where you're storing or how you're storing. Our goal is scientific advancement and not having these data mortuaries. LANDSAT's got more pictures than they're ever going to look at.

So there are many other questions that we have that we're going to submit for the record.

HIRING WOMEN AND MINORITIES

Senator **Mikulski**. We know it's 12 o'clock. We know you have to get back to the Aerospace Advisory Board and start working on it, recommendation by recommendation.

Let me conclude by asking a personnel question that's related to hiring women and minorities. Women made up 28 percent of NASA's work force in 1988 but only 13 percent of the GS-12's and above were women. Has that improved since last year?

Admiral **Truly**. If I might provide that for the record, I would appreciate it. I can tell you that is an issue that we have raised to our senior management level; that is, myself, the associate administrators, and the center directors. We got together about 2 weeks ago and spent several hours discussing how NASA could, even though we think we do as well or better as most agencies of the Federal Government, begin to look around the leadership of NASA and see more women and minorities sitting in those positions. And it has my attention very much.

Senator **Mikulski**. That's why also, for the record, Admiral, the question I asked about women, I'd also like a parallel question to be asked for people of color, which is how many are at the GS-12 or above. And again, the question would go to exactly why there are no people of color or women as either assistant administrators or associate administrators, besides in the EEO program which is the traditional place, and an important place.

Admiral **Truly**. It absolutely is an important place. We're going to have to see a change at the top of NASA so that we can send a signal throughout NASA that it's going to be a long process. This industry and NASA have too many white males sitting in the leadership seats and that does not necessarily mean that we have been discriminating but it's been a culture that has taken time, I think too much time, to change.

Senator **Mikulski**. Thank you, Admiral. We think that NASA really moved aggressively in this area in its astronaut program and it's given us really a profile, the astronaut profile represents the profile of this country—Asian Americans, African Americans—it shows that women are as competent and heroic as the men who have been flying in this country. We believe, also, that that's been very important in encouraging young children to be interested to think of it as me, I could go on.

The other area is, though, that not everybody is going to be an astronaut, but there are so many people that can be part of the space program. We just want to be sure that there's no glass ceiling either in the space agency, just like there's none on the stars.

[The information follows:]

NASA PERMANENT WORKFORCE

	9/30/88	9/30/89	3/31/90
Female Employees			
All	27.4% (6015)	28.3% (6515)	28.7% (6614)
Grade 12 & Up*	13.2% (1813)	14.7% (2132)	15.4% (2279)
Grade 14 & Up*	5.4% (307)	6.3% (378)	6.8% (416)
Minority Employees			
All	14.3% (3152)	15.0% (3442)	15.2% (3506)
Grade 12 & Up*	9.9% (1358)	10.9% (1578)	11.3% (1664)
Grade 14 & Up*	6.2% (352)	6.7% (405)	6.9% (424)

* Includes employees in General Schedule, Merit Pay System, Senior Executive Service, Executive Pay Act, Administratively Determined (NASA excepted) and Scientific and Professional (PL 80-313)

ADDITIONAL COMMITTEE QUESTIONS

Senator MIKULSKI. We will submit the balance of the questions for response in the record.

[The following questions were not asked at the hearing, but were submitted to the Administration for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR MIKULSKI

Strategic Plan

Question 1: When will you complete the agency-wide strategic plan you have promised to do, and when will you submit it to the Subcommittee?

Answer 1: As I testified at the May 4 hearing, I agree with you that the strategic planning is acknowledged to be a critical management tool, particularly in an organization such as NASA which is so forward-thinking in its character. Accordingly, I have already begun a top-down process which is targeted at completing an agency-wide strategic plan during 1990. Mr. Jeff Vincent, Special Assistant to the Associate Administrator for Public Affairs, has been assigned to be editor of this strategic plan effort. This plan is to provide a broad strategy under which the various NASA program elements may develop their individual plans. NASA looks forward to providing the plan to the Subcommittee early in 1991.

Budget Priorities

Question 2: NASA wants FY 1990 supplemental R&PM funds to avoid a hiring freeze and possible RIF's/furloughs. How did this situation occur? Did the seven NASA Center Directors repeatedly warn NASA Headquarters of shortages in this account? If so, why were the warnings unheeded?

Answer 2: The FY 1990 budget request of $2,032.2 million for R&PM was very constrained. Congressional reductions of $13.7 million, a Gramm-Rudman-Hollings reduction of $28 million, plus absorption of approximately $55 million in costs, due primarily to the January 1990 pay raise and increased health and retirement costs of current and new employees, resulted in a funding level that could not support current operations. Therefore, the NASA initial operating plan dated January 5, 1990, requested supplemental appropriations transfer authority of $58.7 million to provide for these unforeseen costs and ensure that the Agency maintain the workforce at the level necessary to implement the approved programs in FY 1990.

Question 3: Does the 17 percent increase (+329 million) in the FY 1991 request adequately cover the R&PM account, or will NASA ask for another supplemental in FY 1991?

Answer 3: NASA's FY 1991 request of $2,252.9 million is an increase of $203.7 million over the FY 1990 operating plan level of $2,049.2 million. This FY 1991 request is adequate to support the requested manpower, travel, and facility operations. Barring reductions to the request or unforeseen changes, NASA should not need a supplemental for FY 1991.

Space Station User Issues

Question 4: The Subcommittee believes it is essential to protect the interests of U.S. scientific users of station. There are concerns among the Station's users, particularly those who will do microgravity experiments. Their concerns include: a) access to the Station by the users, especially during the assembly sequence; and b) amount of electrical power available. The U.S. users would be particularly crippled if the foreign modules were assembled before the U.S. lab is, or if the power it needs is not available. Are you addressing these user concerns and will there be a firm written commitment from NASA to the Subcommittee to deal with each of them to the satisfaction of the Office of Space Science & Applications by the time the preliminary design review is complete?

Answer 4: NASA is sensitive to the need to provide good early opportunities for research activities on the Station. Each of the issues mentioned by the Subcommittee is being carefully addressed, and the effect on users of the sequence in which foreign modules are to be added is a particular item in all the discussions of such scheduling. We will be documenting the results of this accommodation work. To ensure that the early user plans are kept in sharp focus and not downgraded in the detailed assembly plans, we are developing a separate plan for a sequence of launches supporting the users' needs during the assembly period.

Question 5: Why did NASA's most recent monthly Station newsletter highlight potential use of the Station for Moon-Mars, indicating strong interest in this use for the Station, when the microgravity users are not really satisfied?

Answer 5: The Space Station newsletter Station Break is formatted to highlight and meet the interests of a number of Space Station related communities.. Station Break is circulated to schools, universities, and companies in all 50 states, Canada, the member countries of ESA and to Japan. The April 1990 issue lead story was the Moon/Mars initiative but, like every other issue, it also included coverage of user issues. Microgravity articles are regularly included in Station Break. Recent microgravity articles include: Space Physiology Facility, May 1990, Space/Gravitational Biology Program, March 1990, Microgravity Disturbances Experiment, Feb. 1990, Space Station Furnace Facility, Feb. 1990 and Advanced Protein Crystal Growth Facility, Nov./Dec. 1989. Also, the soon to be released June 1990 issue covers containerless processing in the low-gravity environment of space. Microgravity research is clearly of great interest to NASA and many Space Station supporters.

Question 6: Is the Moon-Mars program being given a priority that will justify redesign or payload composition changes for the Station to the disadvantage of microgravity research?

Answer 6: No. The Space Station will be an effective microgravity research facility, and this objective will be maintained during planning for the Moon-Mars program.

Station Problems

Question 7 : The Subcommittee is concerned that there are severe problems that if not adequately treated will damage the Station's credibility and drive up cost. For example, GAO has said NASA has significantly underestimated the threats from space debris. Another example is the Station's computer system (TMIS), which is simply not being used by either NASA's centers or the contractors (Space News, April 23, 1990). What are you doing to tackle each of these particular problems and how much additional money (beyond your current total estimate) will we need to fix them?

Answer 7: We believe that both of these problems can be resolved without significantly affecting overall program cost estimates. NASA is vigorously addressing the threat potential of orbital debris in a number of ways. We are improving our understanding of the debris population with both observational and theoretical work. In this area, we will have data from existing DOD radars and from a new radar whose construction is getting started this year. The best current model will shortly be adopted as definitive for the program. At the same time, we are continuing a program of physical tests of the impact of debris-like objects on a variety of protection system options. Within weeks, a set of design specifications for the debris protection measures will be adopted, so that the hardware designers will have specific guidance. The chosen means of protection will be reviewed periodically for adequacy and cost.

Specific actions have been taken to improve the use and performance of the TMIS. Initially, some problems were encountered in user acceptance of TMIS; however, training and experience as well as completing installation of both hardware and software have greatly alleviated many of these. TMIS provides an essential information integration function across the Space Station Program and has already proven its value in this function. It is designed to make maximum use of facilities already installed at NASA Centers and contractor plants. Resources are allocated to TMIS consistent with program requirements. We know of no material changes needed to the current resources plan.

Question 8: Is NASA aware of other potential major problem areas in the Station program?

Answer 8: While future difficulties of varying importance may always emerge, NASA does not now foresee any major obstacles in the development of the Space Station. The set of Preliminary Design Reviews now going on will focus special attention to the EVA requirements, weight, power and data system to ensure that we understand all the design issues.

Question 9: When problems substantially increase life-cycle costs, is it NASA policy to notify the Subcommittee in a timely fashion before the item appears in news journals? If so, who in NASA has this responsibility?

It is certainly NASA policy to discuss such significant programmatic changes with the Congress in a timely fashion as they arise. The Associate Administrator for Space Flight will be informing the Congress on significant programmatic changes involving the Space Station and Space Transportation System. However, sometimes, confusion has developed because of early reports in the press about preliminary data not yet verified or analyzed.

European Station Problems

Question 10: Europe's chief Station contractor submitted a proposal that was $960 million (35 percent) over the expected cost, requiring a complete overhaul for ESA to meet its commitments to the U.S., Canada and Japan. That will cause a six-month delay in the ESA program, and it has weakened support for the Station in Italy and West Germany, which are paying two-thirds of Europe's contribution (Space News, April 30, 1990). Will this have any effect on the U.S. program and the overall cost of the program to the taxpayer?

Answer 10: The reported delay in the initiation of Phase C/D of the Columbus module could be accommodated by the U.S. program without increased costs. However, ESA has recently stated that Columbus will be available on schedule. If it should be delayed, we would replan some specific scientific uses. In the interim, housekeeping resources such as power and crew time that would have been allotted to ESA would be shared among U.S., Canadian and Japanese users to conduct additional research.

Question 11: If so, why didn't NASA inform the Subcommittee of this problem?

Answer 11: As noted above, we do not expect this to significantly affect the U.S. program.

Orbital-Manuevering Vehicle (OMV)

Question 12: The OMV originally was designed as a multi-purpose "space-tug" to be used to service and repair many satellites. Because of cost overrun above original estimate (88%), NASA has reduced the OMV's mission to re-boosting: a) Hubble (when it's re-boosted a 2nd time), and b) the Advanced X-ray Astrophysics Facility (AXAF) project. Both could be done easily with the Shuttle. Given the enormous cost crunch we face with NASA as a whole, and the fact that we could do both of the OMV's scheduled missions with the Shuttle, what should we do about the OMV? Cancel it or not, and why?

Answer 12: The OMV program has been terminated, as outlined in NASA's letter of June 7, 1990, to the Committee.

Question 13: Would NASA's position change if an upcoming GAO study recommends program termination?

Answer 13: The OMV program has been terminated, as outlined in NASA's letter of June 7, 1990, to the Committee.

Space Shuttle Program

Question 14: For FY 1991, NASA requests $4.4 billion for the Shuttle program, an increase of $700 million over FY 1990. But, in fact, when you add in the life-cycle costs of the Shuttle program (development activities, people and facilities), the cost of the shuttle program is almost $5.9 billion. In the past, the Subcommittee has been able to cut funds in the Shuttle request, knowing NASA could defer its scheduled payment to the Federal Financing Bank on its TDRSS loans and apply these funds (over $200 million a year) to the Shuttle operations. Since the FY 1991 budget eliminates this FFB gimmick, how much "reserve" is in the FY 1991 shuttle budget from which we could cut funds without jeopardizing safety or the flight rate?

Answer 14: Regarding the apparent growth of $700 million in FY 1991, it should be noted that we were able to reduce our FY 1990 request by $454 million based on receiving TDRSS funds --- $227 million were received in late FY 1989 and applied against FY 1990 requirements, and another $227 million will come from this same source in FY 1990. This availability of funding thereby artificially understates the program level in FY 1990 by $454 million. The real increase requested from the FY 1990 level of activity is approximately $300 million. The major reasons for this growth are to fund the first full year of ASRM development (+183.7 million) and support the buildup in the shuttle flight rate from eight in FY 1990 to 11 flights per year in FY 1992 (approximately $130 million).

At the time the FY 1991 budget request was formulated, the plan included $193 million for Shuttle reserves --- less than 5 percent. Since the FY 1991 budget was submitted, there have been significant changes in Shuttle requirements for FY 1991, which will effectively result in the commitment of most of the reserve. These changes have been brought about as a result of increased costs related to the main engine program, operations manpower and labor rates. Operational experience to date with the main engine has caused us to re-estimate the need for engine components which have had to be removed and replaced. Unplanned engine work has had to be conducted on the turbopumps while engines were in the final stages of processing for launch and, in some cases, after engines had been installed in the orbiter. As hardware components are rejected, planning for more downstream engine hardware is adjusted to support the increasing launch rate.

Question 15: What would be the minimum impact if $200 million was indeed cut from the shuttle program?

Answer 15: If $200 million were cut from the Shuttle program in FY 1991, a major re-balancing of the program would be necessary. We are committed to maintaining the current level of safety for Shuttle flights. A reduction of this magnitude would require a trade-off between cancelling near-term Shuttle missions and deleting capability improvements necessary to continue efficient operation of the Shuttle system.

Currently, we are planning to launch 10 missions in FY 1991 and also accommodate program improvements that will keep the Shuttle operational and able to support future payload and manifest requirements. These improvements include the Advanced Solid Rocket Motor to increase Shuttle performance and reliability; the Alternate Turbopump Development to increase the reliability and repair interval of the existing main engine pumps; the extended duration orbiter to allow the orbiter to routinely fly for 16 day missions; and the building of structural spares to minimize orbiter down time in case of damage.

For a definitive reply, a deeper set of trade-offs would need to be performed. However, a major alternative would be deletion of up to two flights in each of the next 2-3 years and a deferral of some system improvements. Both would lead to higher costs per mission as the 12-flights per year goal was delayed.

Question 16: NASA contracts out most of its "Shuttle processing" work, which is mainly the activity needed to prepare the Shuttle between flights. GAO indicates that the contractor's overtime costs have been running about double what NASA's planned for (11% instead of 6%) since the Shuttle returned to flight status. Most of the overtime is due to slower-than-expected Shuttle "turnaround" time, 79 days instead of a goal of 65 days. Why has your orbiter turnaround time not decreased as expected? Is the quality of the Space Shuttle Main Engine an important factor?

Answer 16: Since return-to-flight, the Shuttle processing overtime work and the Shuttle turnaround time between flights has not been reduced as much as previously forecast and expected. However, it is important to note that the program's record of meeting flight commitments has been exemplary. The principal reason for longer-than-expected turnaround times is the large amount of unplanned and unexpected work required for maintenance and repair or replacement, servicing and testing/retesting of the reusable flight hardware, as it shows signs of wear, aging and threats of failure. The Space Shuttle Main Engines have certainly contributed to this additional work in that they must all be removed, refurbished off-line and replaced during each turnaround cycle (or for each mission).

However, there are other contributors such as (a) a "refrigerant" cooling system had to be repaired, which delayed the most recent launch two weeks with expenditure of much work effort and lost time; (b) an APU failed just minutes before the previous aborted launch attempt, also requiring two weeks to replace, recycle and launch; and, (c) a liquid hydrogen recirculation pump failed and scrubbed an earlier flight about four seconds before launch, requiring several days to recover. Each of these scrubs and/or recycles cause almost as much work as an additional (extra) countdown and launch.

There are also other examples where ground systems failures or incidents cause just as much added work and lost time. This unforeseen added work can be absorbed either as additional manhours of work per day or per week (overtime) or by stretching out the schedule and extending the "turnaround" time between flights. NASA has balanced these two parameters when practical, increasing the worker overtime moderately and extending the turnaround time, as indicated in this question, when the manifest pressures will allow the extensions. However, the turnaround time has been reduced from 100 workdays in the OPF (earliest return-to-flight recycle) to 69 workdays, which included several "added work" days.

While the overtime has not been reduced to the goal of 6%, it should be noted that stringent controls currently in place at KSC insure there is no safety concern with the current levels. These controls insure that individuals do not work excessive amounts.

Question 17: Why does NASA's FY 1991 budget request continue to underestimate this overtime cost at 6%?

Answer 17: The overtime estimate of 6% for the FY-1991 budget year was made just before submitting that budget request early in calendar year 1989. At that time, NASA had flown only two return-to-flight Shuttle missions with two different orbiter vehicles and had not completed a single subsequent turnaround recycle flow. We believed we could get the Shuttle Processing Contractor (SPC) overtime down to the 6% level and planned to require the SPC to do so. It was, however, a success-oriented estimate and due to the unexpected "added" work, as explained in the response to Question 16, we have not been able to accomplish that objective. In our preliminary planning for FY 1991 operations, we have committed reserve to cover up to 8% overtime and have set aside additional reserve to cover a threat of up to 10.6% overtime. For FY 1991, additional overtime costs will have to be covered within the budgeted flexibility.

Question 18: If NASA cannot get this overtime cost under control, how much will it cost in addition to the value given in the FY-1991 budget request?

Answer 18: The Shuttle Processing Contactor overtime has been averaging about 10 or 10 1/2% for most of this year. If the requirements for overtime persist, we would have to apply about $20 million of the budgeted flexibility for this purpose.

Single-Points-of-Failure

Question 19: The Subcommittee asked for a report on all of the "single points of failure" source suppliers for all NASA systems by March 1, 1990, because of the loss of two such suppliers (for ammonium perchlorate and rayon) added almost $200 million in unexpected cost to the Shuttle program in 1989. Why is NASA late with the report, since it provided similar information to the National Security Council on this subject?

Answer 19: Senate Report 101-128 tasked NASA to submit a report on those known single points of failure, particularly in the Space Station program. The report is to carefully identify vital subcontractors and their respective activities in addition to other readily identifiable major program activities.

In our letter dated April 6, 1990, in response to the Senate Subcommittee on VA-HUD-Independent Agencies, we identified the process NASA is undertaking to identify single points of failure. A preliminary list was provided to the National Security Council last year with the understanding that further analysis was required to verify that the items were, in fact, single sourced and that their disruption would cause significant program impacts. That list was a first inventory of the possible single sourced items and was not meant to be viewed as the final list of the items. Since that time, NASA has continued to review all aspects of the Space Transportation System (STS) and has revised the preliminary list significantly. This process is iterative, and the list will continue to change as more information becomes available. As stated in the April 6 letter, Space Station is not in a state of maturity yet to identify single points of failure.

We expect to submit a full report on our findings with respect to the Space Transportation System by July 1, 1990.

Question 20: We have heard NASA is looking to buy rayon from a Mexican source. Does this mean that rayon supply, with the Avtex plant now having been closed, is still a problem?

Answer 20: Currently, neither NASA nor any NASA prime contractors are buying Mexican rayon for production purposes. NASA purchased approximately 2.5 million pounds of carbonizable continuous filament rayon yarn from Avtex during its last year of operation to maintain production of motors while new material was being qualified. A new source, North American Rayon (NAR) has expanded its production capacity for rayon yarn by increasing the number of spinning machines in the plant, so that six machines could be available to meet NASA and Department of Defense requirements. NASA is in the process of qualifying this yarn and has completed three small scale firings successfully. The qualification process should be completed by June 1991. If additional steps were required in the future to insure an adequate supply of rayon, we would consider other sources as well. A Mexican firm, Grupo Cydsa, would be a candidate.

Question 21: Does purchasing from a "Mexican Source" violate the Buy American Act?

Answer 21: The rayon suppliers are a fourth-tier subcontractor to NASA, so the Buy American Act would not apply. Moreover, the value of rayon incorporated into the final end product is so minuscule that it would fall below the Buy American Act threshold.

Question 22: How many more AP's and Avtexes are "waiting to happen," what are the major ones in the Shuttle program, and how does the NASA FY 1991 request correct this sole source dependence?

Answer 22: Ammonium Perchlorate is not a single source item, hough the loss of one of the suppliers had major program ramifications. The purpose of the single point of failure study is to assess, to the best of our capability, how many true single sources exist for the STS and to identify measures for dealing with any vulnerabilities. However, it should be noted that tracing suppliers or vendors through all tiers of subcontractors for every component of the STS is difficult at best, and there is always a concern regarding the identification of all potential vulnerabilities.

The report to be submitted on July 1, 1990, will address the known single sources. Action has been taken in certain cases to stockpile material. The FY 1991 NASA budget request, with the exception of where stockpiling has been instituted, does not address any sole source dependencies.

Structural Spares

Question 23: Any damage to major pieces of the Shuttle (wing, etc) could create major delays in the program because of lack of structural spares. The Subcommittee added $25 million for this in FY 1990. NASA's FY 1991 budget request in this category is $52 million. What was NASA's request to OMB for these spares? What was cut out by OMB? (List in priority order for maintaining safety and schedule.)

Answer 23: NASA originally requested $67.4 million from OMB for Structural Spares in FY 1991. The final budget reduced this funding to $52.4 million.

We consider Structural Spares to be a priority program and are currently evaluating alternatives, including applying some of our reserves, to increase the amount for structural spares.

Question 24: When will NASA (with the Air Force) provide to the Subcommittee a strategic plan for a space transportation system after Shuttle --- particularly given the DOD's seeming unwillingness to continue use of the Shuttle past the mid-1990s.

Answer 24: DOD and NASA are implementing the Advanced Launch System (ALS) program in accordance with the report to Congress signed by President Reagan on January 4, 1988. Although the overall ALS program has been reduced as a result of DOD budget constraints, the program has progressed to a vehicle systems design review, has a vigorous advanced development program addressing the necessary technologies to attain the low launch cost goals, and is preparing to initiate a propulsion prototype engine program. Details of the program are being tailored to changing requirements for launch services and advances in technology; it should be available in late summer or early fall.

Question 25: What is our national strategy for developing an advanced launch system (ALS), and what would it entail and what civilian missions (other than Moon-Mars) would require such a heavy-lift system?

Answer 25: DOD and NASA are proceeding with the ALS program in accordance with the report to Congress signed by President Reagan January 4, 1988, though at a constrained budget level. Although the President's report indicated that all funding would be provided by DOD, the recent reductions in the DOD budgets and the increasing importance of the Space Exploration Initiative requirements have resulted in the Administration's proposal that NASA become a funding partner beginning in FY 1991.

There are no active civilian missions (other than Moon-Mars) which require a heavy-lift vehicle. Missions are planned around existing launch capability. If a heavy-lift capability existed, many missions would take advantage of the increased capability with an attendant increase in science data. Further, additional, more scientifically challenging and aggressive missions would now become feasible.

Question 26: What is NASA's position on approaching an ALS program? Is it the same as that for the aerospace plane --- a consortium or "teaming" approach, rather than the traditional contractor/subcontractor relationship?

Answer 26: NASA has not developed a position on the merits of a consortium approach for the ALS program, and would proceed only in concert with its ALS partner -- the DOD. However, consistent with its ALS responsibility for liquid-rocket engines, NASA has issued letters inviting the ALS propulsion contractors to consider a consortium relationship for the ALS Space Transportation Main Engine (STME) prototype program. Contractor responses to the engine consortium letter are due in mid-June.

Science Education Activities

Question 27 & 28: The OTA Report "Grade School to Graduate School" recommends attaching higher visibility to science and engineering education programs in the R&D mission agencies (p. 108). What is NASA's strategic plan in science education, and is it responsive to the OTA Report's recommendations?

Why isn't this at the top of agency's priorities?

Answer 27 & 28: OTA's "Grade School to Graduate School" is a very valuable report that outlines two broad strategies for federal action: 1) recruiting more and different students into science and engineering, and 2) retaining those students already in the pipeline. Many of our existing education programs contribute directly to these objectives. However, the report sharpened our thinking about the need for NASA to have a more comprehensive series of programs that span the 20 years of a student's life from grade school through graduate school. As a result, we have begun a process to revise our existing Five-Year Educational Affairs Plan (1988-1992), which will encompass elements of the OTA Report and incorporate our Science Literacy For the 21st Century (SL-21) education strategy that was designed last year to support the President's Space Exploration Initiative, and our other space and aeronautics programs.

Education programs are a very high priority under this administration.

Question 29: What would NASA's position be if the Subcommittee mandated that the current position of the Director of Educational Affairs be elevated to that of "Assistant Administrator"?

Answer 29: The NASA Administrator has a personal and professional commitment to education, and to NASA's doing its part in contributing to increasing the number of students in the science and engineering pipeline. The Director of Educational Affairs enjoys ready access to the Administrator and to the Deputy Administrator, but at the same time, the Educational Affairs Division is located in NASA's Office of External Relations. This arrangement provides the Administrator control over NASA's education policy and implementation, provides effective and efficient day-to-day management for the education function within a reasonable span-of-control for the Administrator in general, and is consistent with the tenet that executives should have flexibility to structure their own organization.

Question 30: Provide us with a breakout by education level (K-12, undergraduate and graduate) of NASA's education programs in both 1990 and 1991. What is NASA's most successful program at each level and why?

Answer 30: The enclosed Chart A lists the categories of NASA's education activities. Our program grew extensively in the late 1980's, and our 1991 activities will be essentially the same as those in 1990. We now conduct over 160 agency-wide projects at all educational levels.

We consider the Aerospace Education Services Project (Spacemobile) to be our most effective program at the elementary and middle school level. This program reaches nearly a million students directly each year; the feedback that we get from the students and their teachers during and after school visits clearly demonstrates that the program is meeting one of our goals to "capture student interest in science, math, and technology at an early age;" and there is a standing waiting list, year after year, for the Spacemobiles to either visit or revisit the schools. Strong "consumer" demand from "informed consumers" like professional educators is one important measure of educational program effectiveness.

The Summer High School Apprenticeship Research Program (SHARP) for under-represented minority high school students is one of our most effective programs at the high school level. Nearly all of the students graduate from high school, over 95%, go on to college; most select majors in technical fields germane to NASA's mission, and after college, most either go on to graduate school or take jobs in their field of study.

At the graduate level, we regard the Graduate Student Research Program (GSRP) as one of our most effective programs. The students, while pursuing their masters and doctorate degrees, participate in NASA-relevant research. They graduate with degrees specifically related to NASA missions, and either take employment with NASA, universities and industries that perform NASA research, or go into other science and engineering fields of endeavor.

Question 31: What would NASA propose to do with an additional $5 million in FY 1991 for pre-college "Informal Education" activities?

Answer 31: One of the biggest challenges facing our nation is the ability to attract more women, minorities and handicapped individuals into science and engineering and technology. In order to meet this challenge, much has to be done at the elementary and secondary level to interest these students in science and math courses. While we would want to analyze this opportunity in much more detail before providing you any specifics, we would look to the success of our targeted educational programs, such as the Summer High School Apprenticeship Research Program (SHARP) and others as to how they might be expanded and leveraged.

New informal education outreach activities that we are considering include scholarships to attend exemplary space camps, expansion of the Laser Mobile Teacher Resource Room project, expanded use of the NASA Select Television for aerospace education programming, more outreach to community colleges, joint outreach projects with organizations such as the Young Astronauts Council and National Geographic, and development of "take home" aerospace education materials that foster parent-child learning in science, mathematics, and technology.

Question 32: How often are NASA's current education programs evaluated and by whom?

Answer 32: Evaluation is an important component of all of our education programs. For example, every Spacemobile program we conduct in schools is evaluated by teachers and school administrators through questionnaires, and we receive important feedback on both the quality and effectiveness of our effort. In the example of our Summer Faculty Fellowship Program, the American Society for Engineering Education conducts on-site peer reviews of the program and its effectiveness. The National Science Teacher Association (NSTA) provides us with evaluation data on our Space Science Students Involvement Program (SSIP), the NASA Workshops for Math and Science Teachers, and the NASA Workshops for Elementary School Teachers. Oklahoma State University provides us with evaluation feedback on our Satellite Videoconferences for Educators.

Perhaps one of the best indicators of the effectiveness of our programs, however, is that the demand to participate in NASA's educational programs is greater that we can supply, and continues to grow.

Question 33: Has any program been cancelled because it just didn't work? If so, what and when?

Answer 33: In 1985, a reorganization was implemented that placed all of NASA's agency-wide outreach educational programs, grade school through graduate school, under one senior executive creating the Education Affairs Division. Prior to this time NASA educational outreach programs were organizationally fragmented. Since 1985, the division has been in a building mode providing additional personnel and resources to expand and enhance its agency-wide outreach programs to the educational community. Our evaluations suggest that these program are effective. As a result, fine tuning rather than cancellation has been the predominant mode.

Cost Overruns

Question 34: Last year, I expressed my concern over NASA's large overruns for its science missions. They are continuing. For example, the tethered satellite (from $40 to $140 million) and the scatterometer (from $120 to $230 million). What accounts for these large, unanticipated increases?

Answer 34: The NASA Scatterometer is not in an overrun situation. The Scatterometer was originally scheduled to be launched on the Navy N-ROSS mission which was cancelled by Congress in 1988. NASA responded by developing a plan to "build and store" the instrument at the subsystem level in anticipation of an undetermined future launch opportunity. Subsequently, NASA has signed an agreement with the Japanese (NASDA) to fly both the Scatterometer and a TOMS instrument on the ADEOS (Advanced Earth Observing System) satellite which is currently scheduled for launch in 1995. The current Congressional budget request supports delivery of the instrument in 1993 as required by the Japanese. In addition to the changes to the instrument required by flying on ADEOS instead of N-ROSS (including the addition of an antenna deployment mechanism previously provided by N-ROSS), a ground system and mission operations and data analysis were added to the budget.

Approximately, $35 million of the growth in the Tether Satellite is due to schedule slippage. The original launch date for the Tether Satellite was April 1987; the current launch date is May 1991. This includes launch slips due to the Challenger accident as well as schedule slips due to hardware development problems. Approximately, $27 million of growth is due to underestimation of the complexity of the hardware. $22 million of the cost growth has been driven by requirement changes which resulted in increased testing and integration efforts. Over the same time period, the costs to the Italians have increased from about $30 million to $150 million.

Question 35: What other science missions or development projects face more than 5 percent cost overruns in FY 1990?

Answer 35: The Hubble Space Telescope, the Gamma Ray Observatory and the Ocean Topography Experiment have required additional funds in FY 1990 compared to the request included in the FY 1990 President's Budget submission. Funding for the Ocean Topography Experiment was increased in the initial FY 1990 operating plan to meet increased contractor costs and maintain the present development schedule. Requests for associated changes to the FY 1990 operating plan for Hubble Space Telescope and the Gamma Ray Observatory are presently under preparation for submission to Congress, due to additional costs associated with Shuttle launch delays. Both launches were delayed to accommodate the rescue of the Long Duration Exposure Facility (LDEF) before it reentered the Earth's atmosphere.

Question 36: What science missions are underrunning?

Answer 36: Over the next five years, the Office of Space Science and Applications has thirty-six missions scheduled for flight which are either waiting for launch, nearing completion for launch, or in the critical period of their development. With research and development efforts, potential challenges resulting from new advances in technology are always a real probability. All resources are presently considered critical to ensuring the on-time successful development and launch of these programs.

Question 37: What specific steps have you taken since last year to prevent these kinds of cost overruns in the science missions?

Answer 37: OSSA cost containment is based on the vigorous application of resource planning, managing, tracking and reporting procedures for all Space Science and Applications programs. Rather than impose new management systems upon OSSA programs, we believe that, when stringently applied, tested OSSA technical and resource management techniques are superior to any other approach. OSSA cost containment methods are applied to all major research and development programs.

The only fundamental change in OSSA resources management is the development of descoping plans for all new missions, which include thresholds for implementation early in the program. The first of these plans were developed for the Global Geospace Science (GGS) mission. If, during the course of the program, it is determined that the total budget will exceed the planned resources, NASA will be prepared to descope the mission to fit within established funding limits. Descoping options are developed by the program and project managers in concert with the members of the science team. The descoping plan is intended to serve as a pre-negotiated contract among all parties affected, identifying actions to be taken in the event that it is necessary to delete scope from the program. The Associate Administrator for Space Science and Applications will retain this list for implementation as appropriate.

In terms of ongoing measures for preventing cost overruns, the NASA procedure for estimating costs of new science and applications missions consists of extensive and detailed New Start reviews, covering both technical and financial aspects of the program, parametric estimation techniques, and independent reviews by "non-advocates" of the proposed project.

NASA has developed approaches to dealing with the uncertainties of cost estimation in a research and development environment, where original assumptions are subject to frequent changes and advances. We attempt to quantify the uncertainty factors and then to apply appropriate levels of reserve to the project to provide for both unforeseen problems and assumptions that prove to be erroneous during the development cycle. Adequate funding for pre-mission design and planning can help identify potential problems prior to the actual new start proposal, so that the appropriate level of development funding can be planned into the initial budget request.

One factor that has caused overruns in the past is unavailability of launch capability. The Agency has addressed this factor through implementation of the mixed fleet capability, which ensures that the launch vehicle for all future missions will be determined by the mission requirements.

Question 38: Reports persist that the West Germans are going to cut their share of CRAF/Cassini by about 20% due to fiscal constraints caused by increased aid demands from East Germany. Is this so, and if true, what steps are you taking to hold the Germans to paying their original share? What means are available to NASA to try and prevent this kind of action by an international contributor to a science project?

Answer 38: It is true that the Germans are now proposing to provide less than we expected of the propulsion system for the CRAF mission. We are currently negotiating with them in an attempt to increase their share of the system funding, and we expect to complete these negotiations by the end of June 1990. In the future, we will attempt to obtain documentation of foreign commitments early to ensure that program costs accurately reflect funding requirements.

Question 39: If the Germans reduce their share, at what point will it force a decision to "de-scope" this mission because of the "cap" we placed on this project last year?

Answer 39: If we cannot negotiate successfully with the Germans to restore their contribution to the level that we anticipated, then it may be necessary to descope other areas of the program to provide the funds in the early years so that the U.S. can provide a portion of the propulsion system. In accordance with the cost containment plan, the CRAF/Cassini program is currently preparing a prioritized descope list that could be used if necessary. The exact amount of descope required cannot be determined until negotiations with the Germans are completed and the German contribution is confirmed. This action is expected to be completed later this summer.

Question 40: What is necessary to stimulate more interest in the commercial applications of ACTS?

Answer 40: Experimenter interest is highly correlated to the availability of the type of ACTS ground terminal equipment which supports the applications of interest to the experimenter, e.g., High Data Rate terminals for supercomputing networking. The limited lifetime and laboratory configuration of the spacecraft and the risk of a launch failure all make industry hesitant to invest their own dollars in ACTS ground terminal equipment.

An "ACTS Experiments Working Group" has been formed which is comprised of industry leaders who are charged to provide guidance for the experiments element of the program. The experiments program is organized to focus on the major market areas of the ACTS technologies: data; integrated services digital network (ISDN); video (including high definition television communications techniques); mobile, network interconnection; defense; and public services. A significant outreach effort has been implemented to attract greater attention to the ACTS program. These efforts include: strawmen experiments designed and presented to potential experimenters; a quarterly newsletter distributed to 1,700 individuals; papers written or presented at symposia; visits to interested organizations; annually held symposia; and a relationship with trade press and other media to alert the industry of current developments.

On March 5, 1990, NASA released a research announcement initiating the ACTS Systems Concept Development program. This program solicits experiment concepts and encourages respondents to seek additional funding sources for experiment implementation. There is a specific emphasis on the participation of academic institutions. An Experiments Opportunity Announcement (EOA) is currently being prepared for release in September of this year. The document will allow the experimenter community to establish a more formal relationship with NASA, by encouraging them to submit commitments to participate. Although experiment concepts will be evaluated and accepted up to and after launch, the first deadline for EOA submissions will be late 1990.

NASA has contracted for the development of a prototype of one type of experimenter earth station for use with ACTS. This contract defined the costs involved with purchasing such a terminal, and has created a source from which to purchase them. NASA has also issued a public notice to be run in the Commerce Business Daily seeking comments from industry on alternative approaches for stimulating ground terminal investment. The notice appeared in May, and requested that comments be submitted by end of May. Ground terminal development requirements for additional types of terminals are also being examined.

Question 41: What level of funds above the budget request of $34 million would be needed to generate added commercial interest?

Answer 41: We have conducted an assessment of the experimenter terminal development effort needed to support the exploration of new service applications and networks that have the highest potential commercial payoff. We have also identified the scope of a NASA experiments program that would support innovative science data management, sponsor research and utilization and propagation measurements. NASA has recently released a public query on industry involvement in the ACTS experiments program and expects responses during the month of June. These responses will enable us to assess commercial interest in ACTS and evaluate potential funding requirements later this summer.

SETI

Question 42: Could this program be better managed by NASA's astronomy program rather than the life sciences offices since it involves use of the existing radio astronomy network?

Answer 42: Although the Search for Extraterrestrial Intelligence (SETI) will use some of the tools of astronomy, such as radiotelescopes, SETI does not seek to answer astronomical questions. Astronomy seeks to understand the origin and evolution of galaxies, stars, and planets. SETI is a search for life. Integral to NASA Exobiology Program, which studies life in the universe, SETI fits best in the NASA Life Science Program. The Life Sciences Division is running the program well, and has thus far met all cost and schedule goals.

Question 43: What are the total development costs for this program? How does the current estimate compare with the original development estimate?

Answer 43: The current total development cost for the SETI Microwave Observing Project is approximately $54 million in real year dollars. This cost is approximately the same as that originally proposed, with some inflation due to Congressional budget reductions in FY 1989 and 1990 which are recovered in future years.

Question 44: How does this compare in priority with the other two program lines in the life sciences budget; is it a higher or lower priority?

Answer 44: The SETI project has a very high priority within the life sciences program. NASA is pursuing a balanced life sciences program that 1) seeks to assure the health and safety of humans in space; and 2) investigates fundamental scientific questions concerning the effects of space on living systems, and on the origin, evolution, and distribution of life in the universe. Although a part of this latter activity, SETI has been identified separately in the budget because it is a unique ground-based program that is being managed to cost and schedule guidelines that are not related to spaceflight opportunities, as are other program lines in the life sciences budget.

Question 45: Has anyone ever determined if this project could be better run and managed by the National Science Foundation since they are responsible for operating the nation's radio astronomy network?

Answer 45: Over the last several years NASA has had briefings and exchanges of technical information with the National Science Foundation (NSF). NSF, like the National Academy of Science, has always supported NASA as the implementing organization for SETI although it will continue to be involved in the program. By its nature, SETI fits into the NASA charter. The bulk of the SETI project will use unique NASA facilities such as the Deep Space Network, making NASA the appropriate manager of the project.

Moon-Mars (Space Exploration Initiative)

Question 46: What is the 30-year life-cycle cost of the "Moon-Mars" initiative?

Answer 46: Since no program plan has been established for the Space Exploration Initiative, the life cycle cost has not been and cannot be determined.

Question 47: While the budget suggests the SEI budget for FY 1991 is just under $200 million, isn't about $300 million a better estimate, considering the increases over the FY 1990 budget for aeronautics technology? Break this funding out for the record.

Answer 47: The NASA FY 1991 budget request includes an augmentation of $188 million for SEI for several programs within NASA. Only $88 million of this request is included in the Space Research and Technology budget; the remaining $100 million is to be distributed as follows (and is included in their respective budget requests): Space Transportation Capability Development ($50 million); Space Station ($20 million) and Planetary ($30 million).

In contrast, the FY 1991 budget request for the Space Research and Technology program includes only $179.4 million for Exploration Technology in support of the Space Exploration Initiative. This effort is comprised of the former Pathfinder program, initiated in FY 1989, and augmented by $88 million in FY 1991 as part of the SEI budget (discussed previously). This increment ($88 million) was added to the Exploration Technology Program in FY 1991 to provide a broader range of critical enabling technologies for the Space Exploration Initiative (SEI). The Exploration Technology program will provide key data and technology options essential to enabling the SEI, including increasing safety and reliability, reducing risks and costs and providing the required systems performance. The remainder of the Space Research and Technology budget request is for the program delineated below.

In addition to the exploration technology activities, the Space Research and Technology program budget request has other important technology development efforts in support of the agency's future requirements for Space Transportation, Space Science, and Space Station missions. The Space R&T program consists of four elements: the R&T Base, the Civil Space Technology Initiative (CSTI), the Exploration Technology Program (discussed above), and the In-Space Technology Experiments program. Funding for these programs follows:

Space R&T Program	FY 1990	FY 1991
Research and Technology Base	125.0	125.7
CSTI	123.8	171.0
Exploration Technology	26.9	179.4
In-Space Technology Experiments	10.2	19.8
TOTAL	285.9	495.9

In addition to the $88 million SEI augmentation for the Exploration Technology program, the FY 1991 requested budget for the Space R&T program includes planned growth in two additional areas -- CSTI and In-Space Technology Experiments programs. The CSTI program takes critical technologies to the point that the user can confidently incorporate these new or expanded capabilities into relatively near-term NASA missions. CSTI is developing technologies to enable efficient, and reliable access to Earth orbit; enhancing operations in Earth orbit; and increasing the effectiveness of science missions from Earth orbit. The level of funding contained in the President's FY 1990 budget request for the CSTI program was $144.5 million, which was subsequently decreased by directed Congressional reductions and sequestration to $123.8 million in FY 1990. The $171.0 million CSTI budget in FY 1991 reflects restoration of program content and schedules affected by the FY 1990 budget reduction plus planned growth in one element, the Aeroassist Flight Experiment.

The Aeroassist Flight Experiment (AFE) will enable more efficient transportation between high and low Earth orbit. This flight experiment will investigate critical design and environmental technologies applicable to the design of an aeroassisted Space Transfer Vehicle (STV). Application of this technology has the potential for increasing the payload of an STV for transfer missions from the Moon and geosynchronous orbit to low Earth orbit by approximately a factor of 2, as a result of reduced fuel requirements. This activity is on schedule for a 1994 launch of the experimental spacecraft. In addition to providing valuable data as part of the ongoing CSTI program, AFE will contribute to the development of aerobraking techniques needed to support the Space Exploration Initiative.

The planned growth in the In-Space Technology Experiments program will support the development of flight experiments to test highly innovative technologies which require research, testing and validation in the space environment. Taking these experiments into space will enable us to understand basic phenomena and reduce the risk of new technologies to the users. This program provides opportunities for the private sector and university space engineering research communities to conduct experiments in the actual space environment.

In summary, only $179.4 million of the requested $495.9 million budget for Space Research and Technology is for the Exploration Technology program. This effort is comprised of the Pathfinder program, augmented by $88 million as part of the agency-wide FY 1991 SEI augmentation of $188 million. The remaining $100 million of the SEI augmentation is requested for Space Transportation Capability Development ($50 million), Space Station ($20 million) and Planetary ($30 million). These latter three allocations are not part of the Space R&T program budget.

The remaining FY 1991 request for the Space R&T program, which is for the R&T Base ($125.7 million), the Civil Space Transportation Initiative ($171 million) and the In-Space Technology Experiments program ($19.8 million), represents the required resources needed to support important agency commitments for Space Technology in areas other than Exploration and merits strong Congressional support.

Question 48: Does NASA accept the National Academy's judgment that the Livermore Lab's inflatable modules approach to the Moon-Mars initiative (at a cost of only $10 billion) underestimates many difficult engineering and operational challenges involved?

Answer 48: Certainly there are many difficult engineering and operational challenges involved in establishing a permanent outpost on the Moon and in sending humans to explore the planet Mars. NASA agrees with the National Academy's assessment that the Livermore Lab proposal does not fully address these challenges to assure the minimal amount of risk for humans. However, NASA recognizes the importance of considering new and innovative approaches to SEI and our outreach program has been designed with this in mind.

Question 49: What would be NASA's response if the Subcommittee approved the $4.5 million for "outreach" studies in FY 1991, instead of 1990, and deferred funding for the broader SEI project due to fiscal constraints? How would this compromise or impact NASA's strategic plan?

Answer 49: NASA believes the agreement that was reached between NASA and the Committee, to initiate an outreach program using FY 1990 funds and defer mission architecture studies until FY 1991 pursuant to Congressional action on the FY 1991 VA-HUD-Independent Agencies Appropriation Bill, is sensible in the present fiscal environment.

Personnel

Question 50: Last year NASA said it had a serious problem in retaining its senior level employees. Is this still a problem, and if so, what corrective steps are you taking?

Answer 50: Currently, losses of SES employees are down by 50 percent (18 vs 35) compared to losses at this time last year. Our retention problem last year, when losses exceeded those of the previous year by 26 percent, can be attributed to two major factors: a, uncertainty over the impact of the post employment restrictions in the Ethics bill, and b, the defeat of the 1989 SES pay raise. The prospect of a substantial pay raise in

January 1991, is a factor in the reduction in losses this year, and we expect losses to continue at a reduced rate through the next three to five years.

Question 51: This year, OMB permitted NASA to get an add-on above the FY 1990 appropriation to cover 100% of the proposed pay raise. All the other agencies in the bill had to absorb 50% of the pay raise within their personnel accounts. What accounts for NASA's "favorite son" status on the proposed pay raise?

Answer 51: OMB did not permit NASA to get an add-on above the FY 1990 appropriation to cover 100 percent of the proposed pay raise. The Administration's policy was that departments and agencies fully absorb the January 1990 pay raise, including NASA, and that supplementals requesting additional appropriations would not be proposed. However, in absorbing the pay raise, agencies were allowed to submit supplementals proposing transfer authority within the Agency's appropriations accounts. The Administrator of NASA made the determination that the Agency's critical situation warranted transfer authority within these guidelines in order to maintain the workforce necessary to support the approved programs in FY 1990. OMB agreed with this proposed transfer authority within the NASA appropriations accounts.

Question 52: NASA is requesting in FY 1991 about $16 million for headquarters' "transportation" costs (RPM 9-23). How much of this amount is for the purchase of administrative aircraft? How many planes will NASA purchase with these funds? What is the total out-year cost for this upgrade, by year? Does this estimate vary with last year's estimate for upgrading the administrative aircraft fleet?

Answer 52: $13.316 million of the $16 million is for the purchase of an aircraft. The actual purchase price, of course, will be determined through full and open competition.

One aircraft (new or used) will be purchased during FY 1991 with the available $13.316 million.

Out-year costs for the upgrade will be approximately $1 million per year for operations of the aircraft, based on operational experience with NASA's current G-III aircraft. Anticipated out-year operating cost for the replacement aircraft are essentially equivalent to the cost for the 27 year old aircraft it will replace. Although some costs such as fuel will increase, we anticipate these increases will be offset by reduced maintenance costs for the newer more efficient aircraft.

This estimate is in keeping with last year's. Our plans are to replace one of our aging mission management aircraft per year, until the entire fleet of eight is replaced.

Headquarters Appropriations

Question 53: What is the R&PM appropriation for Headquarters in FY 1991?

Answer 53: The Headquarters FY 1991 request is $332,623,000.

Question 54: What amount of this figure is for the Reston level II Space Station Program Office?

Answer 54: The amount for Space Station Level II is $29,510,000.

Women and Minority Hiring

Question 55: Have percentages of women in upper grades improved since last year (1988)?

Answer 55: Yes, significant gains were made in the employment of women at NASA. The percentage of women employees has increased steadily as part of the permanent workforce, a trend that is reflected for higher grade levels such as grades 12 and above as well as for grades 14 and above. (See chart attached)

Question 56: What are the current figures for women and for minority employees in the total workforce, GS-12's and above, GS-14's and above?

Answer 56: Data are shown in attached chart.

Question 57: Are there minority or women assistant or associate administrators besides in the Office of Equal Opportunity Programs?

Answer 57: Yes, there are six (three minorities and three women) assistant/associate administrators or deputies in addition to the Assistant and Deputy Assistant Administrator for Equal Opportunity Programs:

Assistant Administrator, Office of Headquarters Operations
Deputy Associate Administrator, Office of Space Sciences and Applications
Deputy Associate Administrator, Office of Management
Deputy Associate Administrator, Office of External Relations
Deputy Associate Administrator, Office of Communications
Deputy Assistant Administrator (Programs), Office of Commercial Programs

Question 58: What is NASA doing to promote and recruit more women and minority employees in senior positions, particularly GS/GM-14 and above?

Answer 58: NASA has enjoyed the benefits of a "career" work force, that is, people who enter the agency at the beginning of their professional career, and stay throughout their career. As a result, our efforts to bring more women and minorities into senior positions concentrate on giving our current employees the assignments and developmental experiences which will ensure that they are fully prepared to enter the senior positions. Increased visibility seems to be a key element. Therefore, attention is being paid to be sure that women and minority employees are brought into jobs that develop managerial skills and give visibility to the talents of these people. In succession planning discussions, our senior managers are encouraged to identify women and minority employees who have high potential, and to ensure that they are brought along through cross training, temporary assignments, and management courses. An example of an expanded effort is our fellowship programs. NASA pays tuition, fees, and full salary for employees selected for graduate school programs and management education programs. In the recent past, we expanded the number of middle management programs that are specifically for women, such as the Simmons College and Smith College programs.

We are seeing the results of these efforts. To date in FY 1990, 23 percent (eight) of our new SES selections, including seven promotions from within, have been women or minorities.

Question 59: What is the expected FY 90 carryover for ASRM in both the SFCDC and CofF accounts?

Answer 59: The SFCDC unobligated carryover from FY 1990 is estimated at $15 to $20 million, due to the delay in the award of the ASRM development contract. The CofF unobligated carryover is estimated at $51 million, due to the delay in the facility contract award. These unobligated funds will be required next year in addition to the FY 1991 budget request in these areas.

Question 60: A recent internal NASA study says the ASRM could overrun its total cost by $300 million. How realistic is that estimate, to what problem areas were these potential overruns attributed, and what year would the budget need augmentation if the report's conclusions come true?

Answer 60: A NASA independent review team identified a cost threat ranging from $335-$500 million to the ASRM development cost through runout including a six month schedule slip. In addition to the schedule, the team identified threats in the following areas: (a) nozzle development, (b) manufacturing hours, (c) Shuttle systems integration, (d) overhead costs, (e) KSC and Stennis Space Center launch and test support, and (f) plant equipment. The team identified funding shortfalls in FY 1991 and FY 1992. However, the team assessment was of a baseline budget which excluded reserves. The reserves through runout would cover many of these threats if they materialize. In addition, a baseline review with the contractor is being conducted which we feel will resolve those problems in the June/July timeframe.

Question 61: How much reserve is in the $329 million ASRM development estimate for FY 1991?

Answer 61: The FY 1991 ASRM SFCDC budget request is $309 million, which includes a Headquarters' held contingency of about $8 million.

Question 62: A GAO audit report (3/90) was very critical of NASA's management of its computer magnetic data tapes containing irreplaceable space data. Although NASA took exception to the findings of the report, it did not respond to GAO's recommendations. Does NASA have a standard policy to respond to the recommendations in GAO reports?

Answer 62: The standard NASA policy for responding to all GAO reports is in accordance with the provisions of Section 720 of Title 31, the United States Code. As directed by this regulation, NASA prepares a response to each GAO report for certain Committees of the Congress which must include a statement of what actions the agency will take in response to the recommendations from the GAO report. The NASA response to the General Accounting Office's report entitled "Space Operations: NASA is not Properly Safeguarding Valuable Data from Past Missions," was forwarded to various Congressional Committees, including the Senate Subcommittee on VA-HUD-Independent Agencies, on May 14, 1990.

Question 63: When NASA stores its irreplaceable space data at non-NASA facilities, does NASA completely abandon to the vendor the responsibility for the preservation of the records? If NASA's space data magnetic tapes are being stored improperly by vendors, does NASA have a responsibility to act to protect the data?

Answer 63: NASA does not abandon its responsibility for the management of data, even if stored on magnetic tape at contractor operated facilities. If tapes are not stored properly, NASA has the responsibility to act to protect the data. For instance, 135,000 magnetic tapes stored at the Federal Records Center, under the auspices of the National Archives and Records Administration were removed from the facility because of improper storage conditions. These tapes were returned to the Jet Propulsion Laboratory where they are systematically being evaluated, corrected as appropriate, and re-recorded onto higher density and more reliable storage media.

Question 64: In the past five years, what internal and external data archive facilities has NASA inspected, what were the findings, and what were the corrective actions? What were the results of NASA's audits of its vendor's responsiveness?

Answer 64: As part of its management responsibility, NASA conducts regular reviews and walkthroughs of the National Space Science Data Center, located at Goddard Space Flight Center. NASA also reviews archive facilities at non-NASA sites, including the Infrared Processing and Analysis Center (IPAC) in Pasadena, CA, and the Space Telescope Science Institute in Baltimore, MD. NASA also inspects off-site storage facilities, including the Federal Records Centers. NASA has not conducted any formal audits of any of these facilities within the past five years. The regular management review process has been the vehicle for correcting normal operational concerns as well as incorporating management changes and new technologies. The most significant trend in archiving capabilities at many of these facilities, is the conversion to advanced storage techniques such as optical disks, CD-ROM, etc.

EOS and Data Management

Question 65: What are the management and hardware technologies, now established or reasonably expected, that will permit the necessary cataloguing, data stream isolation, proper storage, and efficient retrieval of EOS data for analyses that will prevent NASA burying itself in an ocean of data?

Answer 65: The EOS Data and Information System (EOSDIS) is one of the most important elements in the EOS Program. NASA is committed to providing the resources necessary to acquire the hardware and data management systems, and to improving those systems, as technology advances, to make EOSDIS an ongoing success. This commitment is reflected in the four areas you identified.

For cataloguing, the EOSDIS approach is a distributed one of breaking the data set into more manageable pieces through the use of relational database management systems and several active archive sites. Early use of EOSDIS will allow researchers to examine and establish standards and gain experience with precursor data sets.

The issue of data stream isolation is being addressed by NASA's Customer Data Operations System (CDOS). Data will be specially formatted (packetized) in the instruments onboard the EOS platforms. Packet and virtual channel techniques allow for data descriptions and prompts (headers) which include the address to which the data should be sent for processing by the EOSDIS. An advanced communications network, probably using commercially provided optical fiber networks, is critical to this effort.

EOSDIS will provide for proper storage of data through the use of important emerging technologies, including robotic mass storage systems and helical-scan magnetic tape cartridges. The budget for EOSDIS includes funding for "improving" existing data and reprocessing it as new algorithms develop, and maintaining an active archive in which data is continuously available for use. EOSDIS will also provide for some redundant storage of data off-line.

Efficient retrieval of EOS data will employ standard browse systems using prepared products, extensive electronic networking, maintenance of on-line inventory, directory, catalogue, and browse capabilities, as well as ordering of data. The system will provide continuous updates of data set production status and all data will be maintained on-line or partially on-line with a hierarchy of response rates depending on the timeliness of the data and the level of demand for it. Early EOSDIS activities will include data prototyping and the establishment of data formats and standards.

Question 66: What is the risk that critical technologies will not be ready or will be so inefficient that computer costs of retrieval and data stream extractions are prohibitive? What are NASA's backup approaches if critical technologies are not ready?

Question 66: The risk that critical technologies will be unavailable for use by the EOSDIS is fairly low. The EOSDIS could be built today, although the absence of technology advances could result in the cost of the system exceeding the currently planned budget. We expect to achieve approximately two generations of computer technology advancement before the final elements of EOSDIS are operational, and the system only requires one generation of improvement to meet the planned targets.

Though we do not expect that they will be needed, we have identified potential backup approaches in the event that critical technologies are not available. These include: possible degradation in the timeliness of data searches and other user services; decreases in the number of standard products which are routinely produced when the requisite EOS instrument data is available; increasing the amount of time allowed for data reprocessing; and running models at lower resolution. Storage and networking technology are the key areas where technology advances are needed, and both are currently experiencing rapid capability growth driven by the commercial marketplace.

Question 67: What steps is NASA taking to prevent EOS data from becoming a "data cemetery"? How will NASA protect the EOS Data and Information System's budget from being re-directed to cover EOS instrument and launch shortfall costs?

Question 67: NASA is taking a variety of steps to insure that EOSDIS operates in an efficient, effective, and open fashion. The EOSDIS will include the extensive use of easy electronic access, early prototyping, and strong science user community involvement in the system design, review, and implementation. As technologies improve, the EOSDIS baseline provides for upgrades of the EOSDIS hardware every five years.

The EOS budget line item is being divided into four separate and distinct accounts -- EOSDIS, instrument development, observatories, and science. Funds may not be transferred among these accounts without the permission of the Associate Administrator for Space Science and Applications and the NASA Comptroller.

Organizationally, separate program offices within the Earth Science and Applications Division are being established to handle instruments/observatories and EOSDIS/science. The Goddard Space Flight Center's (GSFC) EOS Project is divided into three individual project offices: instruments, observatories, and the EOSDIS.

Mission to Planet Earth

Question 68: Results of NASA analysis of temperature data from the TIROS-N weather satellites do not show global warming (R.W. Spencer and J.R. Christy, Science, March 1990). Is global warming a real, immediate important problem or not?

Answer 68: The potential for global warming is a serious issue. Consequently, the Administration is committed to an aggressive research program, which will reduce the uncertainties associated with the magnitude and timing of a potential global warming. The satellite data discussed in the Spencer and Christy study is not inconsistent with other balloon and ground-based data which has been collected. Important factors such as natural variability and the shortness of the data record mean that no reliable conclusions can yet be drawn with regards to the global warming theory, because of the limited (10-year) data set.

Question 69: What are the instruments and launches approved as part of the EOS new start by both the U.S. and its international partners? What will be proposed to start in fiscal years 1992 through 2000?

Answer 69: In order to meet the measurement goals of the USGCRP, NASA has designed the EOS program to consist of two series of polar orbiting platforms, with complementary payloads, launched on Titan IV expendable launch vehicles. Our planning includes provision for each platform to be capable of being replaced every five years to achieve the mission goal of 15 years of observations.

The EOS platforms are designed to provide the comprehensive global observations to understand the Earth as an integrated system. The first platform, which will launch in FY 1998, is devoted to measurements of the surface of the Earth, and to the conditions of the lower atmosphere. The second platform, which will fly two-and-a-half years later, is devoted to measurements of the chemistry of the upper atmosphere, the circulation of the oceans, and the behavior of the solid Earth.

The specific instruments which will fly on the two EOS platforms have not yet been finalized. It is likely that the final instrument complements for the EOS-A and EOS-B platforms will be from the group of facility and investigator instruments selected by NASA for Phase B study. All of these instruments are currently undergoing a review of their capabilities and design features. Confirmation of the instrument payload for EOS-A is scheduled for September 1990, with the EOS-B confirmation scheduled for September 1991.

Also included within the EOS runout budget are several attached payloads planned to be flown on Space Station Freedom. Current plans call for initial funding in FY 1993, with first deployment in 1998.

The ESA and Japanese polar platforms have yet to be formally submitted for their equivalents of new starts. The ESA declaration for its first polar platform could receive ESA Council approval for solicitation of participant's commitments during June 1990. The Japanese platform program is currently planned for submission to the Diet for the Japanese fiscal year 1992. Current launch planning shows the first ESA platform with a launch date of Spring 1997, with the first Japanese launch sometime in late 1998. The launch of a second ESA platform is not currently expected before 2000.

The only potential U.S. expansions to the current EOS program would be the addition of the EOS Synthetic Aperture Radar (EOS SAR), discussed in response to Question 81. During this period, ESA is expected to propose the extension of its polar platform into a series and the addition of a second series of polar platforms. Japan may also seek to extend its polar platform into a series.

Question 70: What's the total life cycle cost for EOS for the U.S. over the project's entire lifetime? How would that figure change if unapproved but necessary elements were added to the program?

Answer 70: The estimated research and development appropriation funding costs for the EOS program for FY 1991-2000 total $17-20 billion, including provision for inflation. Current estimates of launch vehicle, related communications and data systems, facilities, and civil service personnel costs amount to approximately $2 billion through 2000. The R&D estimates for the period 2001-2015 assume an average annual funding requirement of approximately $1.3-1.4 billion, expressed in constant 1990 dollars. If new program elements, currently unapproved, but later found necessary, were added to the EOS program, the need for a change in estimated funding requirements would have to be evaluated on a case-by-case basis.

Question 71: The answer to the question "Is the globe warming?" is expected to be answered before EOS is launched and reporting. Why shouldn't the EOS sensors be launched sooner on more numerous and smaller satellites to participate in answering that question?

Answer 71: The recent Spencer and Christy study demonstrates the current difficulty in establishing a concrete scientific basis for or against global warming. Though the 19 Earth science missions planned for launch by NASA over the next several years will substantially improve our understanding of the Earth's systems, it is unlikely that they, or any other series of independent probes, will be able to concretely resolve the interaction between the numerous factors associated with global warming and global climate change. While these missions, such as the Upper Atmosphere Research Satellite (UARS) or TOPEX/POSEIDON, will provide significant data in advance of EOS, they will not provide the simultaneous, and long term measurements which EOS will offer nor the needed understanding of the complex interplay between oceans, atmosphere, land, and biota.

It is this requirement for long-term, simultaneous observations and science that drives the planning for the EOS Program, including the decision to fly the instruments on large observing polar platforms. NASA has stated in the past, with the support of the scientific community (including the recent National Research Council report), that a comprehensive set of simultaneous observations are more important for understanding global change than flying smaller payloads a few years earlier.

Pre-Earth Observing System

Question 72: Indicate the status (life-cycle cost and schedule) of the following missions with respect to the FY 1990 budget. Where appropriate, indicate the change in status, give brief descriptions of the causes, and the impacts to other major programs (e.g. Joint Global Ocean Flux Study, World Ocean Circulation Experiment, Earth Probes, EOS).

Answer 72: Our missions are divided between flight programs and research and analysis activities. Project cost estimates are exclusive of launch costs, foreign contributions, civil service support, and extended mission operations beyond the baselined period.

Flight Programs

Solar Backscatter Ultraviolet/Version-2 (SBUV2)

This instrument is funded from the Mission Operations and Data Analysis budge line in the Earth Science and Applications program. A series of SBUV/2 instruments will be flown on NOAA polar orbiting satellites through the late 1990's.

Atmospheric Laboratory for Applications and Science (ATLAS)

ATLAS-1 is on schedule with a launch date manifested for April 1991. ATLAS- 1 is the first of 10 such missions scheduled to cover the 11 year solar cycle. Atlas-1 includes a total of eleven instruments, five of which are Earth Science related.

Shuttle Solar Backscatter Ultraviolet Experiment (SSBUV)

The mission involves the flight of SBUV/2 instruments on the Shuttle about once a year. These instruments are funded from the Mission Operations and Data Analysis budget line in the Earth Science and Applications program. The budget is approximately $1.4 million per year. The next flight for SSBUV is currently manifested from October 1990.

Total Ozone Mapping Spectrometer (TOMS)

This instrument is funded from the Payload and Instrument Development budget line in the Earth Science and Applications program. The only TOMS mission supported in the FY 1990 budget is the TOMS-Meteor-3, planned for flight in 1991 aboard a Soviet spacecraft.

The TOMS-Meteor mission has a runout cost of approximately $17 million. This mission involved the refurbishing of an existing TOMS engineering model instrument. The TOMS Scout mission is currently scheduled for a 1993 launch, however, additional funding in FY 1991 (under the Earth Probes new start) and beyond will be required to maintain this launch schedule. Total runout cost for this mission is estimated to be $25 million. TOMS missions are designed for 2-3 year mission life and will need to be flown continuously in order to be able to monitor and provide trend data on global ozone levels.

Upper Atmosphere Research Satellite (UARS)

UARS is on schedule for a Fall 1991 launch. Total runout cost is $730-$780 million.

Laser Geodynamics Satellite-II (LAGEOS-II)

The Office of Space Science and Applications does not directly fund this joint Italian effort; however, future science missions may require the use of this capability.

TOPEX/Poseidon

The Ocean Topography Experiment (TOPEX)/POSEIDON program is proceeding toward a June 1992 launch date on the Ariane. Runout cost is estimated to be $450-$480 million. A similar altimeter design will be flown on the EOS mission.

Shuttle Imaging Radar-C (SIR-C)

This instrument is funded from the Payload and Instrument development line of the Earth Science and Applications program. The SIR-C runout cost is approximately $100-120 million. Launch of SIR-C is planned for late 1993.

Sea-Viewing Wide Field Sensor (Sea-WiFS)

Discussions are continuing with potential vendors to develop an ocean color instrument and provide launch services. Once the implementation method is chosen, budgets and schedules will be developed.

NASA Scatterometer

NSCAT is working toward a February 1995 launch on the ADEOS spacecraft. Runout cost for the NSCAT program is $121.40 million. Good technical progress is being made. A similar design scatterometer (STIKSCAT) will be flown on EOS.

Tropical Rainfall Measuring Mission

TRMM is currently in Phase A/B with a proposed new start in FY 1992. Current planning would provide for a launch in 1997. Budgets will be developed in conjunction with the new start process, however, it is anticipated that the mission will have a runout cost of approximately $200-250 million.

Magnetic Field Experiment/Magnolia

This mission is pre-Phase A definition. No firm budgets or schedules have been developed at this time.

Research and Analysis Programs

Global Inventory & Monitoring & Modeling Study (GIMMS)

GIMMS uses data streams from existing operational satellites in their investigation of terrestrial vegetation dynamics. Study efforts are funded through the Research and Analysis budget line in the Earth Science and Applications program. The budget for these activities is approximately $0.5 million dollars per year.

International Satellite Cloud Climatology Project (ISCCP)

Various NASA Earth Science programs contribute to the ISCCP. These programs are funded through the Research and Analysis budget line in the Earth Science and Applications program. The budget for these activities is less than $1 million per year.

Applications & Research Involving Space Technologies Observing Earth's Field from Low Earth Orbiting Satellite

This mission is under consideration for pre-Phase A definition. No firm budget or schedules have been developed at this time.

Verification of Space Data

Question 73: Space observations require surface calibrations of the sensors and surface validation of the effects. The American Geophysical Union's review (March 26, 1990), while extremely positive, points out that: a) EOS's success is critically dependent on well planned validation and data intercomparisons; and b) the responsibility for these studies are in other NASA programs and in other agency and country programs. What are the NASA life-cycle costs for, and where in the budget are, the surface calibration and intercomparison costs of the measurements from space?

Answer 73: EOS planning has always reflected the understanding that studies of global change will require highly accurate long-term data sets acquired by well-calibrated spaceborne sensors and validated through coordinated airborne and surface-based measurement campaigns. For example, the EOS Project Calibration Plan (a first draft issued in June 1989) requires that an Instrument Calibration Plan, an Instrument Calibration Management Plan, and a Data Product Validation Plan documenting approaches and procedures be submitted for each instrument investigation.

The calibration activities are funded through the EOS instrument budget, while the validation activities are considered part of the science funding.

Question 74: Who in NASA has the responsibility for the ground based validation study design and implementation for EOS?

Answer 74: The direct responsibility for the ground based validation study design and implementation for the EOS program lies with the NASA EOS Program Scientist.

The EOS Project officials at the Goddard Space Flight Center (GSFC) are responsible for study formulation. As with all science in the EOS program, the ground based validation study design and implementation plan will be reviewed and analyzed by the EOS Investigator Working Group (IWG), and especially by the specific IWG panel on calibration and validation.

Question 75: What agencies and countries will participate in the calibration and intercomparison studies, especially of sub-system dynamics (e.g., coastal fisheries productivity, changes in bird habitat)?

Answer 75: Within the U.S. government, calibration, validation, and intercomparison studies are reflected in varying degrees in the programs of NASA and the other six major agencies within the U.S. Global Change Research Program (NSF, NOAA, EPA, DOD, DOI, USDA) and the Department of Defense. Internationally, all of the countries participating (or planning to participate) in either the World Climate Research Program (WCRP) or the International Geosphere Biosphere Program (IGBP) will contribute to these activities to some degree. In addition, international organizations such as the World Meteorological Organization, United Nations Environmental Programme, and the European Community will also participate.

Question 76: Is it clear to the other agencies and countries what and when they must budget for the surface validation studies? Are they preparing their plans and budgets? Who has the NASA lead for assuring this?

Answer 76: As with other aspects of the EOS program, planning for validation and calibration efforts has been and remains an important ongoing activity. While the timing for funding and beginning such activities varies by agency, responsibilities are clearly outlined by the U.S. Global Change Research Program and coordinated by the Committee on Earth Sciences. At the international level, the International Geosphere Biosphere Program (IGBP) and the World Climate Research Program (WCRP) are in the early stages of coordinating validation activities. It is important to note that planning and funding of such activities requires far less lead time and advance funding than the construction of major space hardware systems.

The Associate Administrator for the Office of Space Science and Applications has the ultimate responsibility for insuring the successful planning and execution of these activities at NASA.

Question 77: How does NASA plan to enforce these international agreements so our partners don't "back out" on this part of the program?

Answer 77: International activities in global change research, including participation in the EOS Program, are part of a cooperative effort to better understand the nature of the Earth's systems. Each nation is responsible for its contribution to the program, whether a space platform or instrument or the conduct of research or ground testing, and presumably for coordinating that contribution with the activities of other nations and organizations. We have no reason to believe that international contributors to this effort would fail to honor their commitments.

Risks of One Large EOS Platform

Question 78: What are the trade-offs between a large platform (e.g. EOS-A) and multiple smaller, platforms?

Answer 78: The most important difference between flying the EOS sensors on a large platform and a series of smaller platforms relates to the importance of making simultaneous observations.

Within the overall payload of EOS, there are sets of instruments which complement each other in the production of desired observations. In some instances, certain instrument suites are required to yield corrective data. To do this, they must make their measurements simultaneously (within a few minutes or less). These sets dictate certain minimum payload groupings around which alternative scenarios have been built and assessed.

The large EOS platforms are sized to accommodate those instruments which need to observe the Earth simultaneously, viewing through the same column of air. All instruments that observe the surface of the Earth require substantial atmospheric corrections (knowledge of aerosol content, temperature, water vapor, etc.). Thus, it is important to fly all the surface imagers and the instruments which determine atmospheric conditions on the same platform. This requires a total of eleven instruments, approximately 3000 kg of payload, to be flown together. This number of instruments is approximately equal to the number accommodated on the Upper Atmosphere Research Satellite (UARS); however, given the complexity of the EOS instruments, the total payload weight is 30% greater than that of UARS. In addition, EOS has the capability to manage over 10,000 times more bits of data than UARS.

In its careful scrutiny of the EOS Program, the science community (and more recently the National Research Council) recognized the importance of making such simultaneous observations.

As far as risk is concerned, it is not clear that either large or small platforms holds a clear advantage. In either case, the probabilities for a launch problem or failure of an instrument or system are relatively low.

Question 79: Does the EOS design permit replacement of an instrument on the platform if it fails; in what ways will the EOS platforms be serviceable?

Answer 79: One consequence of making global observations from a polar orbit is the inability to service the platforms using existing space vehicles. However, the EOS platforms are being designed with the flexibility to be serviceable, in the event that a polar launch or other servicing capability is developed. Even if such servicing became possible, the redundancy built into the instruments flying on the EOS platforms, and the need for their precise integration, would make on-orbit repair or replacement of an individual instrument problematic.

Question 80: What is NASA's plan if a key sensor (e.g. MODIS) fails on EOS-A? For example, would NASA: a) attempt to service the platform; b) launch a total replacement for EOS-A; c) Shuttle rescue, repair, and re-launch; or d) launch a small satellite with that one sensor? If "d", then: What is the impact on the data set; will measurements from the small satellite satisfy requirements of "simultaneity"? [If yes, then why not begin this way?]

Answer 80: Investigation of historical failure rates indicates that Earth science instruments have consistently performed up to (or beyond) their projected lifetimes, without any significant degradation or failure rate. While such empirical evidence does not necessarily predict future performance, we are designing EOS instruments for five year minimum lifetimes, employing even greater redundancy than the standards which produced such past successes as the Total Ozone Mapping Spectrometer (TOMS) and the Coastal Zone Color Scanner (CZCS) aboard Nimbus-7.

The agency's response to the failure of one of the EOS instruments would critically depend on which one of the instruments had failed.

a) and c) Current flight capabilities do not allow Shuttle servicing or "rescue" of satellites in polar orbit.

b) As a result of several NASA studies of the issue, the EOS Program adopted a platform replacement approach as the means of dealing with instrument failures. The program has been designed to provide for the replacement of each platform every five years. In the event of a major platform or instrument failure, the schedule for processing subsequent platform copies could be accelerated and a copy used as a replacement. This is possible because the EOS Program has designed the two subsequent platform copies (and instrument copies) to be identical in design to the original platform.

d) We asked the scientific community to evaluate the risk of a significant instrument failure and to offer advice on how we should proceed. The overall conclusion of their assessment was: 1) the additional cost of having either single sensors on smaller platforms or "hot spares" (available flight ready instrument copies) for large platforms is too great; 2) a gap in the data is not a critical failure; and 3) the value of a long term data capability of multiple instruments making simultaneous measurements is much more important for improving the long term understanding of the Earth as a system.

EOS Synthetic Aperture Radar (SAR)

Question 81: Is the EOS SAR mission an important contributor to EOS? If so, why is it not initiated in the FY 1991 budget? What are the risks of delaying a commitment and start to EOS SAR?

Answer 81: NASA's budget includes funding to continue the highly successful Spaceborne Imaging Radar (SIR) Program. This series of synthetic aperture radars (SAR) is flown aboard the Space Shuttle (SIR-A in 1981, SIR-B in 1984) and provides precursor missions for the EOS SAR. The next mission, SIR-C, is scheduled for flight in 1993 and should demonstrate the capability and technology for multi-frequency, multi-polarization SAR measurements.

As we performed definition studies of the instruments proposed to be incorporated into the EOS-B platform, we did find incompatibilities between the SAR requirements (primarily in power, mass and data rates) and the multiple instrument concept on a standard EOS platform. As a result, we are currently planning the EOS SAR as a free-flying mission with the orbit and platform designed expressly for acquiring SAR data in the optimum manner.

As part of the SIR Program, we are providing a low level of funding for limited definition studies of the EOS SAR. It is our plan to increase our understanding of the technical challenges and risks in building a radar of this type through the experience gained from the SIR-C development prior to submitting a new start request for funding. This approach suggests possible inclusion of the SAR in the FY 1994 budget request as a new start, with a potential launch of a SAR in the 1999/2000 time frame as part of the EOS system.

EOS Platforms

Question 82: Identify specifically all of the EOS platforms, launch schedules, and sponsors of satellites and launch vehicles. Indicate status (approved and in budget request or not). Give life cycle costs of each platform.

Answer 82: The U.S. contributions to the Earth Observing System are two fully-instrumented polar platform series launched on Titan IV expendable launch vehicles. Each platform will be replaced every five years to achieve the mission goal of 15 years of observations. The first platform, EOS-A, will launch in FY 1998, while the second platform will fly two-and-a-half years later. In addition, several U.S. instruments may be flown on either the European or Japanese platforms. According to the current schedule, the first ESA platform should launch aboard an Ariane V rocket in Spring 1997, with the first Japanese platform launch aboard the H-II rocket sometime in late 1998. The launch of a second ESA platform is not currently expected before the year 2000. Through FY 2000, the cost of the EOS-A platform and experiments is estimated to be $6-7 billion, and the cost of the EOS-B platform and instruments is estimated at $5-6 billion.

EOS and Science Education Pipeline

Question 83: EOS will be a substantial drain on the Earth sciences component of the Nation's science and engineering student "pipeline" flow. What is NASA doing to relieve the drain that EOS will put on the "pipeline" supplying scientists for Earth science and environmental programs in government, industry, and universities?

Answer 83: Because of its strong emphasis on science and data analysis, EOS funding will effectively double the research community that will dedicate itself to understanding global change. Support of this kind will help universities across the country, and around the world, to develop programs in Earth science study and analysis. Such programs will, in turn, train the next generation of Earth scientists.

To further assist in this training process, the EOS program includes significant support for graduate fellowships in global change research.

Question 84: Will NASA replace at least as many as it takes out of the pipeline?

Answer 84: As with other space missions, EOS and other Earth science efforts over the next few years will encourage young people to take up science and math with a concrete goal in mind -- working for the Earth. Interest in the science of global change is growing in our society and our schools. NASA believes that this interest, combined with our strong support of the university research community and the EOS global change research fellowships, will steer a steady flow of young people into Earth science research.

EOS and Science Education Pipeline

Question 85: What is NASA's plan to use Mission to Planet Earth as a way to encourage more young people to enter the fields of math and science?

Answer 85: NASA plans to encourage the intellectual curiosity of young people and their teachers in the fields of mathematics, science, and technology through a variety of Mission to Planet Earth-related education projects. Among these projects is an Educational Satellite Videoconference about Mission to Planet Earth which NASA will host on December 4, 1990. The interactive conference will feature NASA scientists and specialists in aerospace education and global change. Approximately 200 sites across the country will participate in this videoconference, involving thousands of teachers, other educators, and students.

In addition, education activities related to the International Space Year (ISY) Mission to Planet Earth theme are now being planned for 1992. NASA, in conjunction with other ISY participants, hopes to expose students internationally to the promise space holds for the future and how this knowledge will affect those living on planet earth. Some of these ISY activities will focus on using earth observation data to enhance the educational process at all classroom levels. Areas of observation will include enhanced greenhouse effect detection, polar stratospheric ozone, and land cover change.

There is a continuing discussion between NASA's Educational Affairs Division and Office of Space Science and Applications to develop joint educational programs at the elementary and secondary levels in connection with a variety of NASA's science and applications programs. Particular priority is being given to Mission to Planet Earth. To encourage students to stay in the math/science pipeline throughout higher education, NASA offers Graduate Student Fellowships in Global Change Research for students pursuing full-time Ph.D. programs in U.S. universities. Up to 25 fellowships will be awarded in 1990, and up to 150 fellowships per year will be awarded over the length of the Earth Observing System program.

Question 86: What are the results of discussions you have had with Dr. Bromley (OSTP), Dr. Block (NSF), and Secretary Cavazos (Department of Education) to discuss this particular issue?

Answer 86: Representatives of NASA, OSTP, NSF, and the Department of Education are participating in ongoing discussions on how these agencies can become more proactive in science education through the following forums: the Department of Education's Math and Science Education Task Force, OSTP's Committee on Education and Human Resources, under the Federal Coordinating Committee on Science, Engineering, and Technology, and the White House's Domestic Policy Council Education Policy Working Group. Discussions of the "pipeline" issues will continue as these agencies develop their education plans to fulfill the White House's National Goals for Education.

Just this past week, the Secretary of Energy and the NASA Administrator signed a Memorandum of Understanding to increase the cooperation between the two agencies in conducting outreach educational activities. This approach may prove effective as a precedent for meaningful collaboration with other technical program agencies. Attached is a copy of the MOU.

TDRSS-8

Question 87: Funds are included in the FY 1991 request to enable NASA to exercise an option to initiate procurement of TDRS-8. What are your plans for TDRS-8 and how will you proceed?

Answer 87: NASA has reaffirmed its intent to proceed with the construction of the TDRS-8 spacecraft. We have reevaluated the health of the current TDRSS constellation and assessed the potential for coverage gaps if TDRS-8 is not available for launch in the 1995 timeframe. Considering the increasing number of space missions dependent upon the TDRSS, we have concluded that it would be imprudent to take this risk. Long-lead parts are currently being procured for TDRS-8, and we plan to execute the spacecraft construction contract option in FY 1991.

QUESTIONS SUBMITTED BY SENATOR FOWLER

Question 1: As Chairman of the Senate Agriculture Subcommittee on Conservation and Forestry, I am especially interested in the contributions that the Mission to Planet earth program can make in the fields of agricultural and forestry research. Please outline some of the specific benefits you anticipate from EOS and other components of Mission to Planet Earth in studying deforestation, the impact of acid rain, crop and tree diseases, and related questions.

Answer 1: The instruments on EOS, and elements of other Mission to Planet Earth observations, will significantly advance our knowledge of all aspects of the Earth system - land, atmosphere, oceans, and biota. Over the next several years, NASA will launch 19 missions to study particular features of global change. The Upper Atmosphere Research Satellite (UARS) will make definitive measurements of the chemistry and dynamics of the stratosphere, and thus of ozone depletion. The TOPEX/POSEIDON mission is a joint U.S./French effort which will reveal more about the circulation and dynamics of the Earth's oceans than all the ships in history. Other missions include flights of the Total Ozone Mapping Spectrometer (TOMS), Shuttle Radar Lab, and ATLAS Spacelab missions.

All of these efforts constitute NASA's contribution to the U.S. Global Change Research Program (USGCRP), coordinated through the Committee on Earth Sciences. The USGCRP reflects the work of 13 Federal agencies and is an aggressive research effort to reduce the scientific uncertainties associated with global change.

EOS will greatly expand our knowledge in a wide range of areas. Instruments planned for EOS and the Earth Probes program will take important measurements of rainfall quantities and patterns to better understand how such precipitation helps drive the engine of our atmosphere. Observations by imaging spectrometers and passive microwave instruments aboard EOS will allow scientists to assess the extent of damage to forests due to pest infestations and acid rain, while also improving our ability to predict infestations of insects or outbreaks of disease in our forests. These and other instruments will allow researchers to better monitor forest stand condition and productivity, including observations on those areas which have been recently deforested.

EOS instruments will also permit assessment of the degree of degradation of lands subject to desertification, erosion, overgrazing and other activities. Atmospheric sensors planned for the first EOS platform will allow a comprehensive sampling of the atmosphere to detect the levels of pollution and the interactions which takes place.

Not only will the instruments on the EOS platforms offer important measurements of specific Earth processes, they will do so simultaneously. This simultaneity, combined with the extended nature of the observations (15 year data set), will provide the most comprehensive opportunity to study how these processes are interwoven with each other - a chance to understand causes and effects and, thus, to predict how the Earth will behave in the future.

Question 2: As you know, I was very pleased that we were able to provide new start funding for the CRAF/Cassini program in last year's appropriation bill. What is the current status of the program? What was the impact of the sequester-generated funding reduction in the FY 1990 appropriation? What is your current estimate of your ability to fund CRAF/Cassini within the overall funding cap established last year? What would be your preferred alternatives for down-scoping the program if necessary to stay within the cap?

Answer 2: The CRAF/Cassini program is currently in the phase of the program that will establish firm science payloads. The science confirmation milestone for CRAF is in early 1991 and for Cassini in late 1991. The sequester-generated funding reduction to the Office of Space Science and Applications appropriation was not shared by CRAF/Cassini; there is no program impact. At the present time, it appears feasible to complete the program within the overall funding cap established last year. A prioritized list of descope items is being prepared in accordance with the program cost containment plan as a decision tool for CRAF/Cassini program managers, should it become necessary to exercise NASA's option to descope the mission to stay within the cap. Preparation of this list will involve the project science team, and other science advisory groups in order to assure coordination of actions necessary to contain cost.

Question 3: With regard to the Human Exploration Initiative, how will the organization of the program develop? As the Initiative progresses do you envision bringing its components together under a new division? Looking at your projected budgets for FY 92 and FY 93, I see a total of almost $1.1 billion planned for the Initiative. Can you give us any preliminary ideas about how those funds will be distributed?

Answer 3: The organization of the program will develop as the program evolves. Since we do not yet know what shape the program will take, we cannot determine an appropriate future program organization at this time. However, program management is being addressed as we study mission options. In terms of the projected budgets for FY 1992 and FY 1993, we are currently in the process of refining our estimates. The funds will be distributed among NASA programs which will potentially have an impact on Space Exploration Initiative: Space Research and Technology, Space Transportation Capability Development, Space Station, Planetary, and Life Sciences.

Question 4: How does your proposed new program for "heavy lift vehicle studies" relate to the existing Advanced Launch System and Shuttle-C studies? What do you see as the end goal of these efforts: multiple and fully differentiated launch systems? multiple vehicles with many common elements? a single vehicle design? Do you have any timing and budgetary estimates for a new launch vehicle?

Answer 4: The proposed heavy-lift vehicle studies will address two classes of issues: specific requirements identified by the Space Exploration Initiative and an assessment of heavy-lift vehicle evolutionary development options between the lower development cost but higher per-flight Shuttle-C option and the higher development cost but lower per-flight ALS option. Examples of potential SEI requirements include a wide body carrier for Shuttle-C, orbit circularization for Advanced Launch Vehicle, cryogenic hydrogen and oxygen transportation to low-Earth-orbit, and automated rendezvous and docking for both Shuttle-C and ALS.

The end goal of the specific requirement studies will be the identification of candidate technology and/or advanced development programs which could provide the necessary capability in the appropriate timeframe. The end goal of the heavy-lift vehicle evolutionary development assessment will be the identification of feasible approaches that reduce development costs while retaining the low-cost per-flight goals of ALS. In the long-term, these studies are likely to reaffirm the advantages of the ALS family of vehicle concepts where common modules (rocket engines, avionics, propellant tankage and launch infrastructure) are used to accommodate a wide spread of DOD and NASA launch requirements. The diversity of these requirements precludes a single vehicle design. The constrained budget environment probably precludes fully differentiated launch vehicles.

Because specific SEI requirements, program elements, and schedules have not yet been defined, reliable timing and cost estimates for a heavy-lift vehicle cannot yet be made.

Question 5: What is your current assessment of the status of our efforts to facilitate international cooperation with our space program? More specifically, how do you view prospects for US/Soviet cooperation in the exploration of Mars? What is your reaction to Dr. Carl Sagan's call for inclusion of discussion of a joint US/Soviet manned mission to Mars in the upcoming June summit between Presidents Bush and Gorbachev?

Answer 5: International cooperation has been an important dimension of the NASA space program from its inception. The National Aeronautics and Space Act which created NASA in 1958 charged the agency, among other things, to conduct its activities "so as to contribute materially to . . . cooperation by the United States with other nations and groups of nations." This mandate has been consistently reinforced by succeeding Administrations, most recently in the National Space Policy released by the White House in March 1990. In fulfillment of this continuing mandate NASA has entered into well over 1200 agreements with more than 135 countries and international organizations. These relationships cover a broad spectrum of collaborative endeavors, ranging from the development of major space hardware to the sharing of space data among scientists around the globe.

around the globe.

Dr. Sagan's idea is an interesting one. President Bush has already stated that he wants to explore possibilities for international cooperation in the U.S. Space Exploration Initiative (SEI). Discussions will be initiated with Europe, Japan, Canada and the USSR after guidelines for international cooperation have been developed by the National Space Council.

Question 6: What is your response to the March 2 GAO report which alleges that "NASA is not properly safeguarding valuable data from past missions?" In particular, does your current budget request contain "adequate resources" for "improving tape storage and archival facilities?"

Answer 6: NASA agrees that science data is a very valuable resource and we believe we are safeguarding and preserving it as such. NASA has long recognized the perishable nature of magnetic tape and the limitations inherent in storing data on that medium. GAO is correct in identifying potential problem areas regarding the storage of magnetic tapes, but we take exception to the broader generalizations and implications derived from these relatively isolated instances and find them unjustified. Further, GAO fails to adequately reflect significant on-going efforts to remedy current problems and prevent such problems from recurring in the future.

The report points to imperfect adherence and compliance with NARA regulations and standards, but there is no evidence of any significant loss of data. Without such, it is not appropriate to estimate by innuendo the size and scope of data "at risk." The report implied significant damage to the 135,000 tapes being stored in the Federal Records Center in Laguna Niguel. A project to remove these tapes from that center and evaluate their value for long term retention has been initiated. Thus far, 35,000 of the tapes to date have been evaluated, with virtually no loss of data.

The report also lacks balance by failing to accurately represent the expertise, experience, and proven track record we have demonstrated over the past 25 years in recording, storing, and delivering magnetic tapes to the scientific community. The Tape Staging and Storage Facility in Landover, Maryland is cited in the report as one of the centers with the most deficiencies, but the proven effectiveness of this facility in storing and delivering tapes to the science community over the past 20 years with a minimum of complaints is not acknowledged. The facility has also recertified more than 4 million tapes over the same period of time and reprocessed data with an almost perfect record.

We will continue to expand the initiatives undertaken over the past several years to improve the preservation of science data. We will complete the ongoing census activity in conjunction with the scientific community to identify all data products from previous missions that should be archived as a legacy to future generations. We will then systematically, in the priority order determined by the community, restore these products to longer term media, and enhance the overall availability and utility to the general research community.

For future missions, data management and archiving is one of the most important elements in mission planning and management. The emphasis and priority given to the data archiving and distribution systems for the Hubble Space Telescope and the Upper Atmosphere Research Satellite are examples of our commitment. The most significant demonstration of the importance of data handling and storage will come as the Earth Observing System (EOS) program gets underway. Over the life of the program, greater than 35 percent of EOS funding will go directly toward science data processing and management. The scope and size of this commitment reflects a recognition that archiving, delivery, and utilization of data is the essence of mission success.

Our current budget request does not include a specific budget item associated with preserving tapes. This type of activity is part of our archive function and is spread across many efforts. The Information Systems budget line provides centralized Office of Space Science and Applications (OSSA)-wide support in the areas of networking, scientific computing, and data management and archiving. In addition, significant resources for data archiving are also included in the mission operations and data analysis budgets within the individual science discipline programs. The FY 1990 submission to Congress included a $3.0 million augmentation for data management and archiving. Despite the overall reduction we were able to sustain a growth in data management and archiving of greater than $2 million from FY 1989 to FY 1990.

QUESTIONS SUBMITTED BY SENATOR KERREY

Question 1: In a letter to me earlier this year, you indicated that you were working with NSF & EPSCoR Program in connection with Phase II of the National Space Grant College and Fellowship Program. Could you elaborate on your cooperation with NSF and your efforts to broaden your base of support?

Answer 1: NASA has a strong interest in geographically expanding our university activities. In this regard, we are actively working with the staff from the National Science Foundation's (NSF) experimental program to stimulate competitive research (EPSCoR).

Specifically, we have prepared a report which outlines the geographic breakdown of NASA University Research Funding. The report also examines the potential for increasing the geographic diversity of NASA Research Funding through a coordinated effort with state EPSCoR Committees, and provides an analysis of the potential for expanding the research and science education base in states with and the EPSCoR Committee.

This information, which was requested in House Report 101-150, accompanying the VA-HUD-Independent Agencies Appropriations Bill, 1990, is attached.

NASA

National Aeronautics and
Space Administration

Washington, D.C.
20546

Office of the Administrator

APR 26 1990

Honorable Barbara A. Mikulski
Chair
Subcommittee on VA-HUD-Independent
  Agencies
Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Madam Chair:

In view of your interest as expressed in Senate Report 101-128, accompanying H.R. 2916, the VA-HUD-Independent Agencies Appropriations Bill, 1990, I am transmitting a report detailing NASA's implementation of the principles of the Experimental Program to Stimulate Competitive Research (EPSCoR).

Phase II of the National Space Grant College and Fellowship Program was developed by NASA in consultation with EPSCoR representatives and signifies an important opportunity for expanding the principles of EPSCoR into the field of aerospace. NASA looks forward to assisting those states not traditionally involved in aerospace research to develop their institutional capability and competitive posture.

I would be pleased to discuss this matter with you in greater detail, if you wish.

Sincerely,

Richard H. Truly
Administrator

Enclosure

cc:
Honorable Edwin (Jake) Garn

NASA
National Aeronautics and
Space Administration

Washington, D.C.
20546

Office of the Administrator

APR 26 1990

Honorable Bob Traxler
Chairman
Subcommittee on VA-HUD-Independent
  Agencies
Committee on Appropriations
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

In response to direction in House Report 101-150, accompanying H.R. 2916, the VA-HUD-Independent Agencies Appropriations Bill, 1990, I am transmitting a report detailing NASA's implementation of the principles of the National Science Foundation's Experimental Program to Stimulate Competitive Research (EPSCoR).

Phase II of the National Space Grant College and Fellowship Program was developed by NASA in consultation with EPSCoR representatives and signifies an important opportunity for expanding the principles of EPSCoR into the field of aerospace. NASA looks forward to assisting those states not traditionally involved in aerospace research to develop their institutional capability and competitive posture.

I would be pleased to discuss this matter with you in greater detail, if you wish.

Sincerely,

Richard H. Truly
Administrator

Enclosure

cc:
Honorable Bill Green

IMPLEMENTATION OF THE EPSCoR PRINCIPLES
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
APRIL 1990

House Report 101-150, accompanying the VA-HUD-and Independent Agencies Appropriations Bill, 1990, requests the following information concerning the geographic diversity of NASA research funding:

- Geographic breakdown of NASA research funding for the period 1984-1989 (Appendix A);
- Potential for increasing the geographic diversity of NASA research funding through a coordinated effort with state EPSCoR committees; and,
- Analysis of the potential for expanding the research and science education base in states with an EPSCoR committee.

The National Science Foundation's Experimental Program to Stimulate Competitive Research (EPSCoR), began in 1980 with principles of developing and maintaining the health of science and engineering throughout the United States, and providing special assistance to States that have traditionally been less competitive in obtaining Federal R&D support and need special attention in science and engineering education.

NASA is committed to working with the EPSCoR representatives to incorporate the principals of EPSCoR into Phase II of NASA's Space Grant College and Fellowship Program. Phase II affords NASA the opportunity to incorporate the principles of EPSCoR into the field of aerospace.

BACKGROUND

The Space Grant College and Fellowship Program was established by Congress in 1986 with the following objectives:

- To establish a national network of universities with interests and capabilities in aeronautics, space, and related fields;
- To encourage cooperative programs among universities, aerospace industry, and federal, state, and local governments;
- To encourage interdisciplinary training, research, and public-service programs related to aerospace;
- To recruit and train professionals, especially women and underrepresented minorities, for careers in aerospace science, technology, and allied fields; and
- To promote a strong science, math, and technology educational base from elementary through university levels.

PHASE I

Phase I implementation commenced in 1989 when NASA Administrator, Admiral Richard H. Truly, named 21 colleges and consortia as designated Space Grant institutions. The 21 states represent a broad geographic distribution, although the northeast and northcentral United States are more sparsely represented (Appendix B).

PHASE II

In designing Phase II, especially in planning for those states not currently receiving significant NASA research and educational funds, NASA has benefited greatly from advice and information received from NSF EPSCoR personnel (Appendix C). As a result of the interaction between NASA and NSF, one aspect of Phase II is specifically designed to expand geographic participation to those states having an EPSCoR committee, and is pointedly modeled after EPSCoR. Thus, those states will naturally benefit from the existing EPSCoR network.

Through Phase II of the Space Grant Program, which will be announced in late April 1990, NASA will significantly broaden the geographic distribution of the participating states. This will be accomplished through a program element that allows all states not currently participating in Phase I to compete for Phase II institutional enhancing grants. To allow for the greatest geographic diversity possible, only one college/consortia will be selected in each state.

Two types of grants will be available, a Space Grant Program Grant and a Capability Enhancement Grant. The latter aspect of the program, the Capability Enhancement Grant, is specifically designed to focus on building aerospace capabilities of EPSCoR states. States applying for these grants will compete amongst themselves and not with states applying for program grants.

Space Grant Program Grants

Under Phase II, NASA will award 4-year Space Grant Program Grants for coordinated, statewide conduct of programs similar to those being implemented on a broader scale by those Space Grant institutions designated in Phase I. We anticipate that states seeking to participate by means of the Space Grant Program Grant will generally number among its college and university institution(s) involved in various aspects of aerospace research, education and public service, and which may have the potential to become a designated Space Grant College/Consortia in the future. Programs in these institutions/states, therefore, may focus on strengthening one or more aspects of aerospace activity among consortium members.

Programs may be strengthened through multidisciplinary and cooperative programs between colleges and universities, and by incorporating new knowledge and methods into aerospace-related courses of study. Public service activities may address the community and extend into elementary and secondary schools.

Capability Enhancement Grant

NASA will award 4-year Capability Enhancement Grants to states seeking to develop their aerospace research infrastructure. Thus, this phase of the program is designed to increase the potential for expanding the research and science education base in states with an EPSCoR committee, by supporting the development of statewide research infrastructure and facilitating participation in the Space Grant program. The Capability Enhancement Grant will enable the development of a coordinated, statewide approach to enhancing research and development capabilities in aeronautics, space science and technology, and related fields. As stated previously, this grant is modeled after the National Science Foundation's EPSCoR grant, but with a focus on aeronautics and space.

A statewide planning activity conducted in EPSCoR states will assess present capabilities and determine potential opportunities resulting from increased participation in expanded aerospace programs. Plans may be designed in conjunction with other planning activities, such as those already under EPSCoR. The planning activity should consider existing strengths which may be adapted, expanded or combined to provide a specific capability. The planning activity and capability enhancement aspects of the program should each be detailed in the proposal.

The planning committee must include representatives from state and local government, state and/or regional industry and the major universities involved in research and/or training for aerospace careers. Interaction with designated Space Grant Colleges/Consortia, industry, NASA, and other advisors is encouraged.

Fellowships

Grantees will be eligible to receive fellowship awards beginning in November 1991. Institutions will award fellowships to eligible undergraduate or graduate students to further the objectives of the Space Grant College and Fellowship Program. Fellows must be U.S. citizens enrolled in a full-time aerospace-related degree program.

Funding

All participants will receive an annual program grant. As previously stated, only one program grant will be provided to a state. Furthermore, states will be eligible to receive additional awards for bringing other institutions into the consortia. While the basic grant must be matched with nonfederal funds, fellowships and awards for additional consortium members do not require matching. Recipient institutions, however, are encouraged to supplement the program with additional funding.

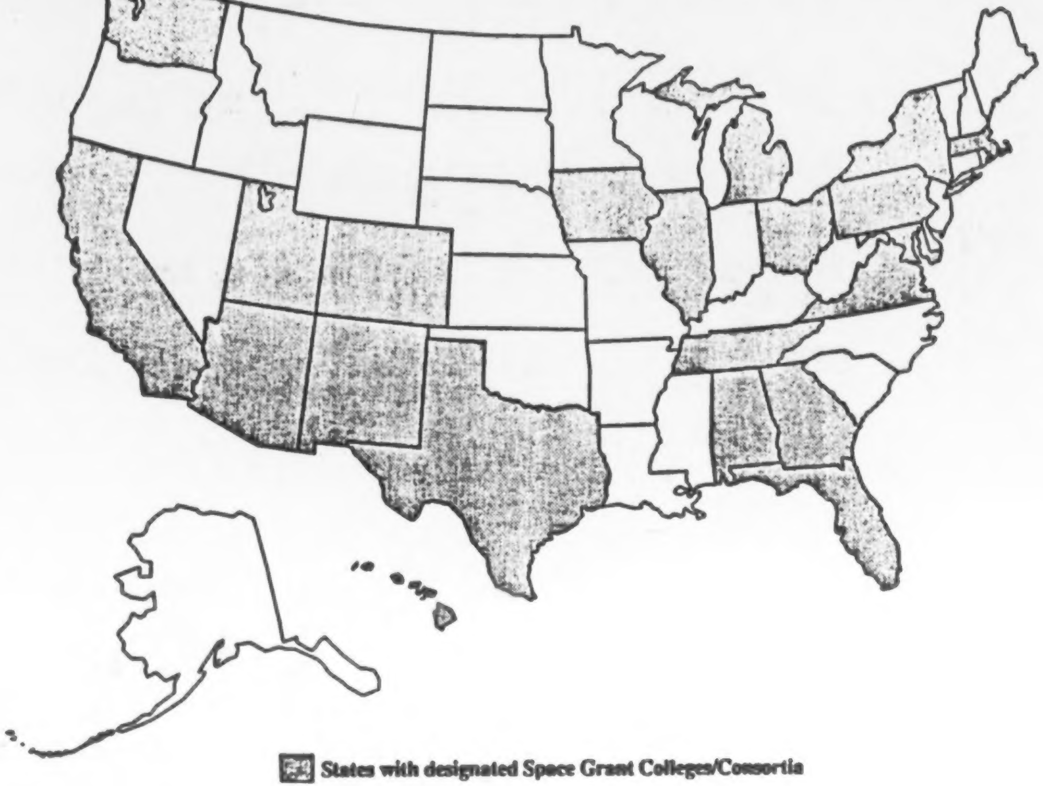
APPENDIX A

Research and Development Expenditures at Universities and Colleges by State Fiscal Years 1984-1989 (Dollars in Thousands)

STATE	1984	1985	1986	1987	1988	1989	TOTAL
Alabama	2,647	4,835	9,060	10,338	12,820	18,002	57,702
Alaska	1,608	1,848	2,182	3,287	2,755	3,365	15,045
Arizona	6,296	7,895	7,869	10,853	12,931	17,508	63,352
Arkansas	25	62	228	235	148	264	962
California	45,066	51,791	55,294	69,275	75,870	106,121	403,417
Colorado	5,904	6,967	11,193	12,482	12,899	15,357	64,802
Connecticut	563	781	998	656	919	1,120	5,037
Delaware	313	220	126	373	684	583	2,299
District of Colombia	3,272	4,656	3,403	4,284	4,368	3,862	23,845
Florida	2,469	2,654	3,175	3,960	4,735	5,362	22,355
Georgia	1,623	2,904	2,704	3,281	3,705	4,663	18,880
Hawaii	3,932	4,876	4,485	4,615	5,802	5,529	29,239
Idaho	86	212	209	275	640	1,692	3,114
Illinois	8,668	8,981	8,795	9,637	8,277	10,685	55,043
Indiana	2,521	2,618	2,718	2,357	2,805	3,897	16,916
Iowa	4,502	4,256	4,339	6,807	7,588	13,016	40,508
Kansas	1,793	1,560	1,336	1,736	1,512	1,313	9,250
Kentucky	361	363	398	508	487	426	2,543
Louisiana	339	694	553	679	1,164	1,169	4,798
Maine	28	70	70	25	122	369	684
Maryland	13,140	11,488	11,697	12,077	13,926	14,187	76,475
Massachusetts	16,633	24,096	16,523	18,650	20,494	27,431	123,827
Michigan	5,747	7,789	11,695	9,591	9,469	12,708	56,999
Minnesota	1,899	2,081	1,586	1,975	1,742	2,625	11,906
Mississippi	373	354	367	446	783	1,338	3,661
Missouri	2,627	2,783	2,430	2,504	2,173	3,382	15,899
Montana	35	231	109	198	271	272	1,116
Nebraska	385	222	322	726	535	691	2,881
Nevada	227	420	335	287	80	402	1,751
New Hampshire	4,365	4,648	3,747	5,561	5,376	5,060	28,757
New Jersey	2,040	3,040	3,262	3,453	3,154	3,882	18,831
New Mexico	3,239	4,223	5,708	6,603	19,529	21,208	60,510
New York	9,898	11,264	11,192	13,993	13,437	17,910	77,694
North Carolina	2,809	2,395	2,729	3,443	3,678	7,108	22,162
North Dakota	26	20	0	61	90	111	308
Ohio	8,483	8,701	11,818	12,352	15,898	19,392	76,644
Oklahoma	815	449	293	483	374	397	2,811
Oregon	1,089	1,202	1,734	1,548	1,273	3,133	9,979
Pennsylvania	5,222	6,048	5,008	6,408	8,998	14,033	45,717
Rhode Island	950	1,278	1,587	1,727	1,813	1,352	8,707
South Carolina	179	355	253	472	572	730	2,561
South Dakota	323	816	443	357	389	426	2,754
Tennessee	1,532	1,735	3,079	2,873	3,983	4,032	17,234
Texas	10,573	10,928	15,693	17,274	20,878	25,251	100,597
Utah	2,616	2,490	1,939	1,892	1,744	1,620	12,301
Vermont	140	83	57	29	113	0	428
Virginia	7,485	8,402	7,664	9,808	11,934	15,857	61,150
Washington	2,716	2,941	3,722	4,327	4,927	4,377	23,010
West Virginia	28	48	216	218	199	231	940
Wisconsin	5,797	7,820	9,138	7,716	9,635	9,825	49,931
Wyoming	433	590	446	512	226	188	2,395
Puerto Rico	0	117	100	217	9	203	646
TOTAL	203,846	237,260	254,027	293,644	337,933	433,665	1,760,375

APPENDIX B

National Space Grant College and Fellowship Program


▨ States with designated Space Grant Colleges/Consortia

APPENDIX C
EPSCoR Representatives Consulted

Joseph G. Danek, program originator
Gerard R. Glaser, a member of the Space Grant Interim Review Panel
Bruce Reiss, EPSCoR Program Manager
Stewart VanScoyoc, Washington EPSCoR Committee
William A. Sibley, EPSCoR
Richard Anderson, EPSCoR.

Question 2: You have a program (NEWMAST) for math and science teachers and another one for elementary school teachers (NEWEST) in which you bring teachers to NASA field centers.

Have you considered working with colleges or universities or a consortium of such institutions in order to combine some type of academic activity with the center experience?

Answer 2: The NEWMAST and NEWEST programs are cosponsored by NASA and the National Science Teachers Association (NSTA) in cooperation with the National Council of Teachers of Mathematics and the International Technology Education Association. Academic credit is offered to the program participants through various colleges and universities near the appropriate NASA Centers. There are always various academic activities relevant to the NASA experience that are required to receive the credit.

In addition, NSTA provides a coordinator for each NEWMAST and NEWEST workshop to help the teachers translate the NASA activities into their respective curricula. The coordinator is usually a science education specialist from a local college or university.

Question 3: For the record, could you supply figures on the numbers of teachers participating in the programs at each center last year and the states from which they came?

Answer 3: Each of the NASA Centers is responsible for the educational programs and services that NASA provides in a geographical region. That breakdown by state is as follows:

Ames Research Center - Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming

Goddard Space Flight Center - Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont

Johnson Space Center - Colorado, Kansas, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas

Jet Propulsion Laboratory - California

Kennedy Space Center - Florida, Georgia, Puerto Rico, Virginia Islands

Langley Research Center - Kentucky, North Carolina, South Carolina, Virginia, West Virginia

Lewis Research Center - Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin

Marshall Space Flight Center - Alabama, Arkansas, Iowa, Louisiana, Missouri, Tennessee

Stennis Space Center - Mississippi

In addition, the Educational Affairs Division at NASA Headquarters provides educational programs and services on a national basis. This includes national educational organizations, conferences, and workshops.

The breakdown on the numbers of teachers participating in NASA's educational programs last year is as follows:

	Number of Teachers
Ames Research Center	2226
Goddard Space Flight Center	1518
Johnson Space Center	1792
Kennedy Space Center	1670
Langley Research Center	4694
Lewis Research Center	2338
Marshall Space Flight Center	2860
Stennis Space Center	961
Jet Propulsion Laboratory	2,500
NASA Headquarters	10,104
Total	30,663

Question 4: S. 2114, a science and math education authorization bill which is pending in the Senate Labor and Human Resources Committee, provides for developing a Science Head Start Program for pre-school children.

Do you have experience in developing materials at this level? What do you think the components of such a program should be?

Answer 4: NASA has collaborated with the National Air and Space Museum to develop curriculum materials at the kindergarten through third grade level, but has not yet developed a preschool program. If NASA were to undertake the development of a preschool education project, we would start by consulting with the Young Astronaut Council. The Young Astronaut Council (YAC) has already developed a preschool aerospace curriculum module, the Youngest Astronauts, as a prototype for additional curriculum enrichment modules based on a variety of subjects for Head Start programs. We have been very impressed with YAC's materials in this area, as well as with the outreach of its program through YAC chapters around the country.

Any such preschool education project should fulfill the following criteria: The materials should be age appropriate and in accordance with early childhood education practices. Parents play a significant role in the early learning process; therefore, any such project should include both classroom and at-home activities. The need to expose preschool children to critical thinking skills and the scientific method of inquiry has been made painfully obvious by recent studies. Any preschool education program undertaken by NASA would strive to establish a life-long appreciation for math, science, and technology, by introducing activities and experiences in those subjects as early as possible.

Question 5: With NASA's involvement in EOS, you move more forcefully into the earth sciences field. Will this have an impact on the types of educational materials you will be preparing and disseminating?

Answer 5: Yes. We will expand our development of educational materials and activities for teachers to use in their earth sciences classes and seek out collaborative activities within other organizations, such as National Geographic. We will also support activities that help to teach students to receive and analyze available and prospective scientific and engineering data generated from space science missions that apply to their environment. Specific approaches to materials are still in the planning stages.

Question 6: To what extent have you been involved in the preparation of curriculum materials for use in the classroom and in informal programs such as kits which can be used for a one-time science experiment?

Answer 6: NASA has had a curriculum enrichment publications program since 1963, in response to a demand for materials to assist educators in the use of space-related materials, through work with teachers and teacher training institutions. From the outset the publications have been channeled toward specific grade levels or disciplines and are developed by contract with specialists in the respective areas. The materials we produce are teacher-oriented publications and compilations of suggestions for teachers' classroom activities, rather than textbooks or courses of study.

The first was published for the elementary school teacher:

Teaching to Meet the Challenges of the Space Age. Introducing Children to Space and The Planetarium, also for the elementary school, followed. Later, Life Sciences in a Space Age Setting was published for the junior high school teachers and a similar publication was produced for industrial arts teachers. An Aerospace Curriculum Resource Guide, K-12, spanned all disciplines and was prepared in collaboration with the Massachusetts State Department of Education. A series, Space Resources for Teachers, covered several scientific disciplines. Some of these have been updated. A significant aspect of these materials is that they have been prepared by the nation's top educators and tested in the classroom by the educational community.

Teacher's Guides that include classroom activities are prepared for specific programs, such as the ASTRO-1 Observatory and the Hubble Space Telescope. Lithographs illustrating particular projects have explanatory material on the back with suggestions for classroom use.

The NASA Facts series of publications inaugurated in 1962, developed into two formats: the wallchart, suitable for posting, and a booklet that can be filed or placed in a binder. Each deals with a single NASA program and individual issues are updated and reissued and new subjects are added as appropriate. In recent years, Teacher's Guides related to a specific NASA Facts have been prepared as well.

Many more aerospace educational publications for teachers and students are needed and will be produced as additional resources become available to hire a cadre of curriculum writers with background in aerospace and education.

Question 7: One complaint raised during the hearings on S. 2114 was that science, math, and engineering materials that we developed were not broadly disseminated. What has your experience with dissemination been, and do you have any suggestions for improved dissemination.

Answer 7: NASA uses many methods to distribute its science, mathematics and engineering materials to the education community and to the public at large. The following is illustrative:

1. Direct mail response to public mail.
2. Distribution to elementary, secondary and university libraries.
3. Distribution to a current listing of teachers and educators.
4. Distribution to Federal Depository Libraries.
5. Distribution by Aerospace Education Services Program (AESP/Spacemobile) specialists at lectures.
6. Distribution at NASA workshops for math and science teachers (NEWMAST) and NASA workshops for elementary school teachers (NEWEST).
7. Distribution at Teacher Resource Centers (TRC).
8. Distribution at NASA summer teacher workshops.
9. Distribution at Science Service's state and regional science and engineering fairs for high school students.
10. Distribution at NASA's intensive community involvement programs.
11. Distribution at Urban Community Enrichment Programs (UCEP).
12. Distribution at Summer High School Apprentice Research Programs (SHARP).
13. Distribution at School-Without-Walls programs.
14. Publications support of undergraduate and graduate university programs, including Graduate Student Researchers Program (GSRP), Summer Faculty Fellowship Program, and Resident Research Associates Program.
15. Distribution at national educational conferences and conventions.
16. Distribution at youth activities (i.e., Boy Scouts, Cub Scouts, GSA, 4-H, Career Days, career guidance requests).
17. Distribution through NASA Videoconference Series.
18. Distribution through NASA SPACELINK, an electronic information system for educators.
19. Sale by the Superintendent of Documents, Government Printing Office.

In addition to the above listed activities, many civic organizations and institutions request NASA educational publications to support their activities.

Notwithstanding this array of distribution methods, there are still large sections of the education community that we do not reach. Among the reasons are the large number of school's in our nation and the costs of development and distribution of hard copy publications.

Question 8: There is a coordinating committee for math, science, and engineering education in the executive branch, headed by Admiral Watkins. Does NASA have a role with this committee?

Answer 8: The committee that Admiral Watkins chairs is the new Committee on Education and Human Resources, which is one of a number of committees under the Office of Science and Technology Policy's Federal Coordinating Council for Science, Engineering, and Technology, FCCSET. Under Secretary of Education, Dr. Ted Sanders, and Dr. Luther Williams, Science Advisor of the National Science Foundation, serve as vice chairs. NASA's representative on the Committee is Mrs. Margaret Finarelli, Deputy Associate Administrator for External Relations.

Question 9: Admiral Watkins has expressed an interest in using the national labs for teacher training programs. I assume this would be consistent with your efforts at the field centers. Have you had any discussion with DOE on how your efforts might be coordinated?

Answer 9: We have established a good working relationship with the Department of Energy (DOE) on science and mathematics education programs. DOE and NASA recently signed a Memorandum of Understanding to work cooperatively on education programs to help improve the nation's science, engineering, and math programs and help to attract and to retain more young people in thee careers. Collaboration on teacher training programs at our respective laboratories and field centers is one component of our Memorandum of Understanding.

Question 10: If money were not a factor, how many teachers and how many students do you think you could reasonably accommodate in a worthwhile program in your field centers each summer?

Answer 10: Currently, during the summer months, each field center serves an average of 180 teachers in on-center educations programs, for a total of approximately 1,620 teachers. If program and staffing funds were not a factor, perhaps an additional 1,600 teachers could be served, which assumes 30 teachers per week in each Center for a 12-week period. However, an important constraint is that physical space is inadequate for individual teachers and groups of teachers in our laboratories and other NASA facilities for developing hands-on projects and experiments. A similar constraint applied to on-site facilities for students, many of whom have mentors.

Also, there is the opportunity to reach more teachers and students by expanding the NASA Urban Community Enrichment Program (UCEP) that operates principally in urban areas for a period of eight weeks at a time. This program, staffed by two Aerospace Education Specialists and a Program Manager, provides in-depth aerospace education programs to some 600 teachers and 22,000 students in two urban school districts each year.

By expanding the Urban Community Enrichment Program from one to three teams, teacher and student participation could be increased to 1800 and 66,000 respectively.

Question 11: Are your Teacher Resource Centers connected to any networking capabilities, either yours or NSF's for example?

Answer 11: Yes, the 9 Teacher Resource Centers (TRC) at the NASA research centers form the Teacher Resource Center Network, along with 27 regional TRC's at universities and museums that have an outreach capability to schools in their areas. The Network includes the Central Operation of Resources for Educators (CORE), which is designed for the national and international distribution of aerospace educational audiovisual materials. Among the formal criteria for designation as a NASA Regional Teacher Resource Center is "having the potential to network and cooperate with other educational institutions and/on centers."

Question 12: You have indicated a plan to have at least one regional teacher resource center in each state by 1992. What kind of progress are you making? Do you have sufficient funding --- I would assume that this is a relatively inexpensive effort.

Answer 12: The 36 Teacher Resource Centers (9 at NASA centers and 27 Regional TRC's) in operation are located in 21 states. The average cost to NASA to open a new TRC is $6,000, plus $3,000 - $5,000 annually to supply updated materials. We are still planning to have at least one regional TRC in each state by 1992, where warranted by school population and other factors.

Question 13: Have you undertaken any studies to determine your needs for scientific and technological personnel in the decade ahead and into the next century? Could you supply whatever results you have?

Answer 13: Our Office of Space Science and Applications is currently conducting an analysis of space scientists projected to be needed through the turn of the century. Factors being analyzed in this study include space science program demands, retirement forecasts and the projected Ph.D. pool. This study is being done in collaboration with the NASA Advisory Council who will use it to help develop priorities for long term personnel needs. The study will be completed later this year and we will be please to share the results.

Question 14: There is a Nebraska Technical Assistance Center at the university in Lincoln. It has been supported in part by the university center program of EDA. Some of those centers are scheduled to have their EDA funding phased out. Are you aware of this situation? Do you know how many centers are affected? Is any funding available through NASA?

Question 15: The technical assistance centers are a viable means of disseminating technical information and promoting the application of existing technologies. Do you have any plans for expanding or upgrading this capability?

Answer 14 & 15: We understand that currently there are 57 grantees in the Economic Development Administration's (EDA) University Center Program nationwide -- excluding Vermont, Rhode Island, Connecticut, and Wyoming which are not considered to be economically distressed states. Under EDA guidelines, base funding of about $100,000 is provided per year for a period of 5 years followed by a phase out period of gradual funding reduction--from $75,000-$44,000 for the 6th year and to $50,000-$20,000 for the 7th year. University cost share contributions are also required by EDA toward each grant awarded. It is also our understanding that many of these centers are entering their sixth or seventh year and are slated for reduced EDA funding. Such is the situation with our NASA Industrial Applications Center (IAC) at the University of Southern California and their State Affiliate organizations in Idaho, Iowa, Montana, Nebraska, Oregon, and the State of Washington. These IAC Affiliates receive EDA University Center grants and are in the final stages of that Program.

NASA's IAC Affiliates Program involve agreements between a NASA IAC and a state-sponsored business or technical assistance center that provide access to the NASA technology transfer network. NASA IAC Affiliates are an extension of its ten IAC's, regionally disbursed throughout the U.S., that offer information (i.e., scientific and engineering data bases) retrieval services and technical assistance in the use of NASA/federal technology.

Recognizing that the Nebraska Technical Assistance Center in Lincoln primarily supports small business interests through the application of NASA and other federal technology, it is hoped that the university in Lincoln will continue to transfer R&D technology to industry with further university and state assistance. While NASA is aware of the EDA guidelines and the Nebraska EDA grant phase-out situation, it is currently not able to offer any more assistance to this center or any other IAC Affiliate with the current limited IAC resources.

Question 16: Could you provide me with a description of the NASA Funds spent in Nebraska in Fiscal 1989 and 1990?

Answer 16: The total for FY89 (10/01/88 - 09/30/89) is $690,611.00.

The total for FY90 (10/01/89 - 03/31/90) is $386,886.00.

A breakdown of the requested information is attached.

NEBRASKA

NAG 3-95 **University of Nebraska - Lincoln** 4235
Intercalated carbon fiber conductor for aerospace use
Period *Obligations*
09/01/80-01/24/90 FY89: $45,000 TOTAL: $353,482
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Woollam, J. A. LERC/Jaworske, D. A. 45-Elec Engr

NAG 3-154 **University of Nebraska - Lincoln** 4236
Surface passivation of III IV compound semiconductors for microwave applications
Period *Obligations*
03/10/81-12/31/89 FY89: $25,000 TOTAL: $592,652
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Woollam, J. A. LERC/Pouch, J. J. 13-Physics

NAG 3-806 **University of Nebraska - Lincoln** 4237
Error protection for digital image transmission over noisy channels
Period *Obligations*
07/01/87-08/15/90 FY89: $80,198 TOTAL: $146,252
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sayood, K. LERC/Whyte, W. A. 45-Elec Engr
LERC/Miller, E. F.

NAG 3-866 **University of Nebraska - Lincoln** 4238
Laser deposition of thin film superconductors for microelectronics preparation and evaluation
Period *Obligations*
01/15/88-01/13/90 FY89: $50,000 TOTAL: $100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Woolam, J. A. LERC/Warner, J. D. 13-Physics
Ianno, N. J.

NAG 5-825 **University of Nebraska - Lincoln** 4239
Far ultraviolet study of supergiant semidetached and contact systems
Period *Obligations*
08/01/86-07/31/88 FY89: TOTAL: $24,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Leung, K. C. GSFC/Kondo, Y. 11-Astronomy

NAG 5-839 **University of Nebraska - Lincoln** 4240
The evolution and chromospheric phenomena in dwarf Cepheids
Period *Obligations*
09/01/86-06/30/88 FY89: TOTAL: $13,700
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schmidt, E. G. GSFC/Kondo, Y. 11-Astronomy

NAG 5-890 **University of Nebraska - Lincoln** 4241
Measurement and analysis of latent and sensible heat flux
Period *Obligations*
04/15/87-01/31/90 FY89: $150,000 TOTAL: $327,004
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Verma, S. B. GSFC/Toll, D. 39-Env Sci, NEC
GSFC/Hall, F.

NAG 5-894 **University of Nebraska - Lincoln** 4242
Measuring and modeling near surface reflected and emitted radiation fluxes
Period *Obligations*
04/15/87-01/31/90 FY89: $185,000 TOTAL: $400,099
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Blad, B. L. GSFC/Toll, D. L. 39-Env Sci, NEC
GSFC/Hall, F.

NAG 5-916 **University of Nebraska - Lincoln** 424
Design of source coders and joint source channel coders for no
channels
Period *Obligations*
06/01/87-06/14/90 FY89: $34,950 TOTAL: $123,9
Prin. Invest. *NASA Tech. Officer* *CASE Categ*
Sayood, K. GSFC/Yeh, P. S. 49-Engr, NE
GSFC/Morakis, J. C.

NAG 5-957 **University of Nebraska - Lincoln** 424
Modeling vegetation atmosphere interactions for Fife
Period *Obligations*
07/15/87-12/14/89 FY89: TOTAL: $5,34
Prin. Invest. *NASA Tech. Officer* *CASE Catego*
Norman, J. GSFC/Camillo, P. 39-Env Sci, NE
GSFC/Gurney, R. J.

NAGW 983 **University of Nebraska - Lincoln** 4245
FOS simultaneity in optical and thermal on Konza prairie
Period *Obligations*
12/01/86-07/31/89 FY89: TOTAL: $19,97
Prin. Invest. *NASA Tech. Officer* *CASE Catego*
Norman, J. M. HQ-EE/Tuyahov, A. J. 39-Env Sci, NE

NAGW 1099 **University of Nebraska - Lincoln** 4246
Directional radiance modeling of vegetation in thermal and sola
wavebands
Period *Obligations*
06/01/87-11/30/89 FY89: TOTAL: $74,00
Prin. Invest. *NASA Tech. Officer* *CASE Categor*
Norman, J. M. HQ-EE/Ruzek, M. J. 39-Env Sci, NE
Walter, E. A. HQ-EE/Murphy, R. E.

NAGW 1266 **University of Nebraska - Lincoln** 4247
Synoptic analysis of ice melt from Nimbus-7 SMMR
Period *Obligations*
09/01/87-12/31/89 FY89: $48,685 TOTAL: $92,112
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Anderson, M. R. HQ-EE/Thomas, R. H. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1275 **University of Nebraska - Lincoln** 4248
Surface recordings of vestibular responses to pulsed acceleration
Period *Obligations*
12/01/87-11/30/89 FY89: $20,000 TOTAL: $40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jones, T. A. HQ-EB/Halstead, T. W. 51-Biological Sc

NAGW 1751 **University of Nebraska - Lincoln** 4249
Interaction of radiation with planetary gases
Period *Obligations*
06/01/89-11/30/89 FY89: $19,865 TOTAL: $19,865
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Samson, J. A. HQ-EL/Bergstralh, J. T. 11-Astronomy

NCA 2-318 **University of Nebraska - Lincoln** 4250
Development of composite finite dynamic elements for analysis of aircraft structures
Period *Obligations*
06/01/88-05/31/90 FY89: $35,940 TOTAL: $69,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Martin, C. W. ARC/Gupta, K. K. 41-Aero Engr

NGR 28-004-021 **University of Nebraska - Lincoln** 4251
Interaction of radiation with planetary gases
Period *Obligations*
02/23/73-05/31/89 FY89: $15,973 TOTAL: $626,112
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Samson, J. A. HQ-EL/Fox, K. 31-Atmos Sci
HQ-EL/Quaide, W. L.

FY1990

REPORT MA03
AS OF MARCH 31, 1990
NASA'S UNIVERSITY PROGRAM

NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM
ACTIVE NASA/UNIVERSITY PROJECTS
(IN DOLLARS)

1OUMISOO192

AGREEMENT NUMBER	START MO-DA-YR	END MO-DA-YR	CURRENT FY OBLIGATIONS	CUMULATIVE OBLIGATIONS	STA- TUS	PRINCIPAL INVESTIGATOR	TECHNICAL OFFICER	TECH OFFICE	CASE FLD	OBJ	ACC NUM
NEBRASKA											
UNIVERSITY OF NEBRASKA - LINCOLN											
NAG 3-95 INTERCALATED CARBON FIBER CONDUCTOR FOR AEROSPACE USE	09/01/80	01/24/91	45,000	408,482	1	J A WOOLLAM	D A JAWORSKE	LERC	45	12	4019
NAG 3-154 SURFACE PASSIVATION OF III - IV COMPOUND SEMICONDUCTORS FOR MICROWAVE APPLICATIONS	03/10/81	12/30/90	50,000	642,652	1	J A WOOLLAM P G SNYDER	S A ALTEROVITZ	LERC	13	11	4020
NAG 3-806 ERROR PROTECTION FOR DIGITAL IMAGE TRANSMISSION OVER NOISY CHANNELS	07/01/87	08/15/90	0	146,252	1	K SAYOOD	W A WHYTE E F MILLER	LERC LERC	45	11	4021
NAG 3-866 LASER DEPOSITION OF THIN FILM SUPERCONDUCTORS FOR MICROELECTRONICS PREPARATION AND EVALUATION	01/15/88	01/13/91	50,000	150,000	1	J A WOOLAM N J IANNO	J D WARNER	LERC	13	11	4022
NAG 5-890 MEASUREMENT AND ANALYSIS OF LATENT AND SENSIBLE HEAT FLUX	04/15/87	01/31/91	90,997	418,001	1	S B VERMA	D TOLL F HALL	GSFC GSFC	39	11	4023
NAG 5-894 MEASURING AND MODELING NEAR SURFACE REFLECTED AND EMITTED RADIATION FLUXES	04/15/87	01/31/91	111,615	511,714	1	B L BLAD E A WALTER-SHEA	D L TOLL F HALL	GSFC GSFC	39	11	4024
NAG 5-916 DESIGN OF SOURCE CODERS AND JOINT SOURCE CHANNEL CODERS FOR NOISY CHANNELS	06/01/87	06/14/90	0	123,930	1	K SAYOOD	P S YEH J C MORAKIS	GSFC GSFC	49	11	4025
NAG 5-957 MODELING VEGETATION ATMOSPHERE INTERACTIONS FOR FIFE	07/15/87	12/14/89	0	5,342	1	J NORMAN	P CAMILLO R J GURNEY	GSFC GSFC	39	11	4026
NAGW 1266 SYNOPTIC ANALYSIS OF ICE MELT FROM NIMBUS-7 SMMR	09/01/87	12/31/88	0	92,112	1	M R ANDERSON	R H THOMAS W S WILSON	HQ-EE HQ-EE	33	11	4027

NEBRASKA (CONTINUED)

UNIVERSITY OF NEBRASKA - LINCOLN (CONTINUED)

AGREEMENT NUMBER	START MO-DA-YR	END MO-DA-YR	CURRENT FY OBLIGATIONS	CUMULATIVE OBLIGATIONS	STA-TUS	PRINCIPAL INVESTIGATOR	TECHNICAL OFFICER	TECH OFFICE	CASE FLD	OBJ	ACC NUM
NAGW 1275 SURFACE RECORDINGS OF VISTIBULAR RESPONSES TO PULSED ACCELERATION	12/01/87	11/30/90	0	40,000	1	T A JONES	T W HALSTEAD	HQ-EB	51	11	4028
NAGW 1751 INTERACTION OF RADIATION WITH PLANETARY GASES	06/01/88	11/30/90	39,274	59,139	1	J A SAMSON	J T BERGSTRALH	HQ-EL	11	11	4029
NCA 2-318 DEVELOPMENT OF COMPOSITE FINITE DYNAMIC ELEMENTS FOR ANALYSIS OF AIRCRAFT STRUCTURES	06/01/88	05/31/90	0	69,800	1	C W MARTIN	K K GUPTA	ARC	41	12	4030
NGR 28-004-021 INTERACTION OF RADIATION WITH PLANETARY GASES	02/23/73	05/31/89	0	626,112	1	J A SAMSON	K FOX W L QUAIDE	HQ-EL HQ-EL	31	11	4031
NGT 00-050-214 GRADUATE STUDENT RESEARCHERS PROGRAM	06/01/87	05/31/88	0	18,000	1	N R GORMAN	F C OWENS	HQ-XE	46	02	4032

QUESTIONS SUBMITTED BY SENATOR GRASSLEY

Question 1: Explain NASA's justification for the request of $16 million for the initiation of Phase B studies for the Assured Crew Return Vehicle.

Answer 1: Completion of the ACRV definition and preliminary design, including the contracted Phase B studies and supporting in-house activities requires $16 million in FY 1991. The Phase B contracted studies are a priced option in the Phase A (prime)/B contracts which were initiated on April 1, 1990. These studies will provide system design and cost information needed to support a decision on ACRV development. The six-month Phase A' requirements validation and concept definition is currently in progress. The Phase B studies, planned for an October 1 start, are required to complete the ACRV preliminary design and to provide the corresponding cost, schedule and Space Station Freedom interface data. Phase A', which expands the in-house Phase A analyses and requirements definition, includes trades on major parameters such as the ACRV crew size and definition of the limits on the gravitational forces that the crew will experience upon reentry. Phase B will produce the systems definition, preliminary design, operational concepts and Space Station Freedom interface definition. The Phase B information would be required both to prepare the ACRV technical specifications for development and to allow Space Station Freedom to factor ACRV requirements and capabilities into the Freedom design process. Completion of ACRV Phase B preliminary design in FY 1991 would support an ACRV development schedule that would be compatible with Freedom permanently manned capability in July, 1997.

Question 2: Will this Phase B study be necessary if the Space Station Freedom's manned capability schedule is delayed for budget or other reasons?

Answer 2: Yes, the Phase B is needed to provide the system design and cost information needed to support a decision on ACRV development. This information is required during the Space Station design process because of potential impact on system interfaces, operational planning, and other considerations.

Question 3: What assurances can NASA give that the ACRV will be a low-cost, proven-technology system?

Answer 3: We expect the Phase B systems definition and preliminary design data to confirm the in-house Phase A concept of a low-cost, proven-technology system. Current concepts for ACRV fall within the experience base of Gemini, Apollo and the Space Shuttle. No high risk technology requirements have been identified in ACRV planning. The current ACRV schedule and budget estimate, which resulted from in-house Phase A studies, are consistent with a program that relies on proven technology.

Question 4: Will NASA operate the space station even if ACRV capability is not developed.

Answer 4: NASA believes that an assured crew return capability must be seriously considered for the Space Station Program, and has initiated Phase A'/B studies to provide more specific system design and cost information.

Question 5: What are the Soviet capabilities for medical or other emergencies with their MIR Station?

Answer 5: The Soviets have a return capsule, the Soyuz TM, attached to the Mir at all times when cosmonauts are at Mir. We understand that on at least four occasions the Soviets have returned crew members to Earth either for medical problems requiring immediate care or for problems with the life support system. Cosmonauts on Mir and Salyut also have taken refuge in the Soyuz capsule in case of potential damage to the station.

Question 6: Can't we rely upon existing ground-based systems for emergencies?

Answer 6: NASA studies initiated in FY 86 and finalized in FY 89 concluded that a space-based rescue system would be more appropriate. In emergencies, space-based systems can respond in minutes or hours; whereas, ground based systems require weeks or months. Independent groups such as the National Research Council, Aerospace Safety Advisory Panel, and the Aeronautics and Space Engineering Board, have agreed that a space-based system is required.

Question 7: What impact to the space program would you expect in the event of a Station crew catastrophe that might have been avoided with an ACRV?

Answer 7: An assured crew return capability is needed to avoid just such a catastrophe, which would likely result in a loss of public confidence in the Space Program.

This would obviously be a severe blow to the Space program, which is why we believe an ACRV must be seriously considered for the Space Station. However, it should be noted that there are a number of other measures to safeguard the crew that are already being implemented. These include enforcing a design philosophy that does not normally permit single points of failure, using fault tolerant systems, using components with adequate safety margins, and providing for a crew safe-haven capability in the event of emergencies.

Question 8: Rockwell International, McDonnell Douglas, Pratt & Whitney, and General Dynamics have proposed the establishment of a national industry team to develop and produce the experimental NASP vehicle. What is the status of the Administration's review of this proposal?

Answer 8: The Administration is concluding a careful review and is in the final stages of approving teaming for NASP.

Question 9: What do you view as the potential benefits of this team approach to NASP in terms of maximizing the investment of both the government and industry?

Answer 9: Four major benefits will accrue from teaming. First, the contractors will share technological advancements and "lessons learned." The improved data base and technological insight should not only accelerate the program but also produce a new vehicle concept superior to the existing set of separately conceived X-30 configurations.

Second, the tightening of the program focus (on a single, new vehicle concept) will enhance efficiency by simplifying the list of research and development items required.

Third, without the constraints of rules related to contractor competition, government agencies can make more wide-ranging and substantial contributions to the program. The agencies do have much to contribute, since they still employ many of the international experts who continued to develop hypersonic technology before the NASP program was initiated in the mid 1980's. One simple example of the enhanced government-contractor interaction is the collaboration on testing specific, instead of generic, vehicle concepts (without having to give equal support for a configuration of each separate contractor).

Fourth, each contractor will continue to build his capabilities in transatmospheric technologies. This will mean that five major U.S. aerospace companies will be capable of competing on operational vehicles that will follow the NASP X-30.

Question 10: Does this proposal pose any antitrust problems?

Answer 10: All aspects of teaming that could relate to antitrust laws have been reviewed by the legal staffs serving the NASP Joint Program Office and the Air Force Systems Command. In essence, there can be no "antitrust" problems because the NASP program is directed at research and not production. Teaming will actually work to enhance competition in the future by ensuring that the five major companies that will team for NASP will have the technological expertise to bid competitively on operational, NASP-derived vehicles.

Question 11: The new Administration has placed a strong emphasis on technology development and technology transfer. Does NASA have any plans to facilitate technology transfer either through a business incubator or similar method?

Answer 11: NASA's Technology Utilization (TU) program is a network of specialized NASA Field Installation TU offices and contractor organizations dedicated to assisting industry to access, apply, and utilize NASA technology. In addition to ten TU officers and other support contractors who promote NASA technology for commercial opportunity, NASA operates ten Industrial Applications Centers (IAC), regionally dispersed, to facilitate the transfer and development of technology. All of these IAC's work closely with business incubators or other state-sponsored projects to stimulate and enhance small business and technology development. One of the largest industrial incubator programs in the Nation was established in Oklahoma. There are currently 11 incubator facilities and 5 more under construction in Oklahoma, that are being supported by Rural Enterprises, Incorporated/Central Industrial Applications Center (REI/CIAC), Durant, Oklahoma, a NASA IAC. Under the REI/CIAC Business and Industry Incubator Program, the contractor is providing incubator tenants an opportunity to reduce the initial risks of starting a business with graduated rent, financial packaging assistance, manufacturing /technical assistance, shared administrative duties, employee training and technological (i.e., scientific and engineering) data searching. The enclosed brochure briefly summarizes the Rural Enterprises Program. Other IAC State-supported business incubator programs in the Nation operate with similar incentives to encourage technology and economic development.

Small Business Development Center (SBDC) affiliations also offer viable means for NASA/IAC's to facilitate the accomplishment of technology transfer and development. The IAC's establish strong working relationships with State-supported SBDC's and innovation centers and participate in technology-driven activities toward high-tech advancement and international competitiveness. There are currently 43 States participating in affiliate agreements with a NASA/IAC. Each of these IAC's provides a full range of technology transfer and business development services and most of these IAC affiliates are located at SBDC's.

Question 12: Last year NASA established the first class of National Space Grant College and Fellowship Program. What are NASA's plans for the Space Grant Colleges?

Answer 12: The National Space Grant College and Fellowship Program, in many ways, recognizes and reinforces the long-term relationships between NASA and the designated universities. Requirements for designation included a significant funding history with NASA as reflective of this relationship. This requirement was included in the first competition in order to assure that the first group of universities would be leaders in aerospace and therefore in a position to use their resources to carry out balanced programs of research, education and public service.

We began working with the designees soon after selection and convened the First National Space Grant Conference in January 1990. This conference brought together Space Grant Directors and their staffs, NASA Field Center personnel and Headquarters officials. A major objective was to share ideas on how to best carry out program plans as outlined in the winning proposals and refined through discussion with assigned Field Centers. Issues discussed in conference workshops included pre-college, college and adult education, the recruitment of underrepresented groups into science and engineering, outreach to elementary and secondary students and the public, the involvement of state and local government and industry, the administration of the fellowship programs, and methods of program evaluation. We have since requested and received individual program objectives from each designated institution and this data will form the basis for evaluating the program.

Each Space Grant College and Consortium has been paired with a NASA Field Center and the NASA University Affairs Officers are working closely with the Space Grant Directors to facilitate program implementation through sharing of resources and information. We plan to maintain continuous dialogue with all Space Grant Colleges and provide advice, assistance, and guidance where necessary. Formal systems of communication are being established; campus visits are made during travel to nearby locations, and we are in the early stages of planning our second conference for March 1991. The emphasis of this conference will be on first year accomplishments and plans for the integration of Phase II designees.

Phase II of the National Space Grant College and Fellowship Program was announced May 31, 1990. This competition is targeted to the 29 states not now involved in the program as well as the District of Columbia and Puerto Rico. There will be two categories of competition. The Program Grants category is for states with some aerospace activity and the Capability Enhancement Grants category is for states with little or no aerospace activity. Grantees in the first group will be funded to implement balanced programs of research, education, and public service similar to Space Grant schools; grantees in the second group will receive funding to improve their research capability and their ability to complete for federal research.

Question 13: Will NASA target the Space Grant Colleges for University Research Funding?

Answer 13: An eligibility requirement for Space Grant Designation was that an individual university or a consortium of universities had to have received at least an average of $2,000,000 per year in NASA research and development funding for FY's 1986 through 1988. Twenty-eight of the top 50 universities that NASA funded in FY 1989 were designated colleges or members of designated consortia. In short, most of the designees are recipients of significant NASA research funds because of their strong research capabilities. They will, no doubt, continue to be extremely competitive for NASA research funding.

In contrast, Phase II competition was designed so that all states not now involved in the Space Grant Program are eligible. The capability enhancement grant component of Phase II is modeled after the National Science Foundation's EPSCoR Grants. Funding will be provided for the improvement of research capability and infrastructure at universities with minimal aerospace activity. While we have no plans to target NASA research funding to these universities, we are hopeful that our grants will contribute to enhanced competitive standing with resulting NASA awards. We are developing a method to track research proposals from and research grants to schools selected under the Space Grant Program.

Question 14: In 1988, NASA established the first class of nine Space Engineering Research Centers. The eventual goal of

NASA was to establish a total of twenty Space Engineering Research Centers. What are NASA's plans to fund a second class of Space Engineering Centers? When will be second class of Centers be funded?

Answer 14: Strengthening the nation's capability and leadership potential through support of university engineering research and education is a critical, high priority goal for NASA and OAET. The nine University Space Engineering Research Centers, competitively selected in April 1988 from the 115 proposals received, have shown excellent progress and are producing quality results. However, other high priority activities did not allow us to dedicate the funds for additional University Space Engineering Research Centers in FY 1991. Our highest priority is to follow through with our commitment to support the nine current centers in the program. Additional centers will be selected through a competitive process and will depend on overall funding levels and the relative priority of this activity.

QUESTIONS SUBMITTED BY SENATOR BYRD

AdaNET Program in West Virginia

The AdaNET program is designed to provide for the transfer of software to the commercial sector in order to stimulate the reuse of software applications into manufacturing, automation, and robotics sectors. This program also helps to avoid duplication of software and program efforts by Government and industry. The FY 1991 budget includes $4 million for the AdaNET program, an increase of $1 million over the FY 1990 level.

Question 1: Please provide an updated summary of the AdaNET program in West Virginia, including accomplishments within the past year, and a status report on its implementation.

Answer 1: AdaNET, as a West Virginia initiative, constitutes a national software engineering research and technology transfer program coordinated by NASA and operated by MountainNet, Incorporated, of West Virginia and its supporting associates in West Virginia and Texas. AdaNET's objective is to develop a national facility in West Virginia for acquisition and dissemination of government-generated software components to increase U.S. productivity and economic growth. The program is now focused on identification and analysis of requirements for software components, and development of systems to facilitate software engineering technology transfer. Software components, to be gathered from/provided by NASA, the Department of Defense, and others, will be housed in an electronic repository and made available for reuse via computer networks.

In the past year, AdaNET has developed and deployed a new version of its West Virginia software engineering network and repository, AdaNET Service Version 2; added software components from the Army, NASA, and other locations to the repository; improved technical and management systems; and researched additional user and technical requirements. Based upon this experience, AdaNET has formulated a 24-30 month plan for next phase development, operation, and analysis.

Question 2: Also provide for the record a list of the specific activities which are being carried out, and a five-year plan for the program.

Answer 2: The following major activities will be carried out during the next phase of AdaNET research (starting in the third quarter of FY 1990): a) Requirements Definition; b) Requirements Analysis and System Development; c) System Operation; and d) Evaluation. Included in these major activities are market research; identification of potential AdaNET users in industry and government; establishment of AdaNET special interest groups; upgrades to AdaNET software; new software development, including development of a sophisticated reusable software library; identification of government sources for software components; adding software components and related information to AdaNET; upgrades for the AdaNET computer center in Dellslow, West

Virginia; software engineering research; analysis of legal issues involved in reuse; coordination with other government organizations involved in software reuse; operations and prototype analysis; and user support.

This next phase is expected to require 24-30 months of effort (i.e., through FY 1992). NASA funding for the AdaNET Program is $3.0 million in FY 1990 and $3.0 million has been included in the FY 1991 budget request. When this phase is completed, results of AdaNET research and development will be presented to program sponsors for analysis and decisions about future operation.

National Technology Transfer Center, West Virginia

During processing of the FY 1990 VA, HUD, and Independent Agencies Appropriation bill, I secured an amendment in the amount of $4 million for initial funding of the National Technology Transfer Center (NTTC) to be established at Wheeling Jesuit College in Wheeling, West Virginia. The FY 1991 budget includes $5 million for the project. The NTTC is intended to be a national center for technology transfer which will enhance the ability of United States industry to compete by facilitating the transfer of federally-sponsored research and development to America's private sector. A definition study of the NTTC was conducted in FY 1989, at my request, and preliminary NTTC technical requirements studies are now complete. An acquisition management team has been formed and is at work, and a planning grant of $1 million was awarded to Wheeling Jesuit College in March, 1990, to implement both the NTTC and the "Classroom of the Future" projects.

Question 3: Please provide for the record the current status and a five-year plan, including significant milestone events for the NTTC. May I have your assurances that NASA will continue to work constructively with Wheeling Jesuit College to assure the effective implementation of this program?

Answer 3: NASA, indeed, successfully awarded a "planning grant" to Wheeling Jesuit College during early March 1990, to begin initiation of both the National Technology Transfer Center (NTTC) and the "Classroom of the Future." This was accomplished as planned with Wheeling Jesuit College.

The "planning grant" covers the period between March 1990 and October 1990, during which time the final plans for the NTTC development are expected to be accomplished. Further, during this period (March-October 1990), NASA and Wheeling Jesuit College will begin negotiations of a "Cooperative Agreement Award" to be finalized not later than September 1990 for effectivity during the period of November 1990 through FY 1995.

As currently envisioned, implementation of the NTTC development plans commences on November 1, 1990. The first phase of development is expected to be accomplished by approximately September/October 1992, and will represent "Initial Operational Capability (IOC)" of the NTTC. At this point, the NTTC is expected to begin generating revenues for services rendered to business, industry, government (Federal and State), although limited in nature. The second phase of the NTTC development begins approximately November 1992 through expected completion of development by the end of FY 1996. At this point, Full Operational Capability (FOC) is expected to be achieved and the NTTC is expected to operate entirely from revenues generated for services delivered or rendered to business, industry, and government.

NASA assures that all reasonable efforts will be undertaken to constructively and cooperatively work with Wheeling Jesuit College to bring the NTTC project to a highly successful conclusion in accordance with our joint schedules.

Question 4: What can be done to accelerate the implementation of the NTTC at Wheeling Jesuit College?

Answer 4: Development of NTTC through achieving FOC in FY 1996 is currently planned on an aggressive, but achievable, schedule. NASA will, in working closely with Wheeling Jesuit College, continuously assess the progress of the NTTC development with the intention of accelerating the development process, as appropriate, while keeping an "all success" approach through FOC. It is not expected, however, that NASA and Wheeling Jesuit College will issue revised/accelerated planning earlier than achieving IOC, on or before September 1992.

Classroom of the Future

During processing of the FY 1990 VA-HUD-Independent Agencies Appropriations bill, the Committee concurred in the House allowance and provided $1.4 million over the budget request to establish and equip a computer software program at Wheeling Jesuit College which will develop software for space science education at the college and other sites throughout the Nation. This software center will be one component of many to be developed by NASA under the broader context of a "Classroom of the Future."

Question 5: Please provide for the record a description of the scope and objectives of this effort and what steps have been taken to date to execute this program.

Answer 5: The objective of the "Classroom of the Future" is to establish a classroom that utilizes the state of the art in educational technology to teach science and aerospace concepts to teachers and students in the surrounding Wheeling area. NASA is hopeful that this classroom will serve as a model which will be replicated in other communities served by each NASA regional center. The Classroom of the Future contains the following components:

Nationwide Educational Technology Study

Wheeling Jesuit College will conduct a nationwide survey and study of technology equipment, systems hardware, software and processes to be included in the proposed Classroom of the Future.

They will provide a written report which will serve as a basis for the development of the facility. The study is underway and Wheeling Jesuit College is surveying and visiting classrooms that are currently known for their use of technology, leadership in the field of educational technology, and the quality of vendors and educators. The study is expected to be completed by October 1, 1990.

Teacher Resource Room

A teacher resource room will be established as part of the Classroom of the Future for the purpose of distributing aerospace, science and math curriculum materials to the teachers in West Virginia area. These materials will include the following formats: prints, slides, film strips, audio cassettes, compact discs and computer software. The college has placed an order for equipment and materials for this room. They have also hired an educator to supervise the teacher resource operation. The room will be housed in temporary quarters on campus.

A teacher workshop will be conducted August 12-17, 1990, at Wheeling Jesuit College. The purpose is to build leadership throughout the state by utilizing the teacher resource room and the Classroom of the Future. NASA is supporting the workshop with space science lecturers, educators, and scientists.

Software Development

As as part of the Classroom of the Future, the project will develop educational software for distribution to elementary schools. Wheeling Jesuit College is in the process of hiring a computer programmer and a production person for this task. NASA and college officials have discussed possible education software products for development.

Computer Camp

A computer camp for the West Virginia students and teachers will be in operation - Summer of 1991.

Question 6: "What is your Five-Year Plan for the Classroom of the Future?"

Answer 6: Discussions with Wheeling Jesuit College have centered on a three-year plan. The primary focus is to get the Classroom of the Future staffed and operating. Major projects and activities by year are:

FY 1990 - Establish Teacher Resource Room (temporary quarters on campus);

Teacher workshop (August 12-17, 1990) to build leadership related to the Teacher Resource Room;

Complete national study on Classrooms of the Future.

FY 1991	Teacher Resource Room in Operation
	Initiate Summer Computer Camp
	First Software Development Project
	Final Design - Classroom of the Future
	Purchase Equipment, Hardware, and Software for Classroom of the Future
FY 1992	Teacher Resource Room in Operation
	Software Development
	Summer Computer Camp
	Student and teacher programs in full schedule

Question 7: What amounts are needed to continue the funding for this program?

Answer 7: The total amount provided in FY 1990 was $1.3 million, of which $360,000 was transferred to Wheeling Jesuit College for FY 1990 start-up activities. The remaining $940,000 was placed in escrow for purchase of equipment, hardware, and software for the Classroom of the Future in FY 1991. Our discussions with Wheeling Jesuit College officials indicated that additional funds would not be required for FY 1991. FY 1992 budget requirements, if any, have not been determined.

Question 8: Can construction be accelerated into FY 1991 to move this project forward?

Answer 8: NASA funding will permit a concept study and classroom technology study to be completed this fiscal year. NASA has no plans to provide funding for construction; this would be the responsibility of Wheeling Jesuit College.

Question 9: May I have your assurance that NASA will continue to work with Wheeling Jesuit College throughout the implementation of the program?

Answer 9: Wheeling Jesuit College goals and objectives are consistent with NASA's education plans for the future. NASA will be heavily involved in the Classroom of the Future through implementation. As the Wheeling program grows and matures, we see a long term relationship.

QUESTIONS SUBMITTED BY SENATOR DeCONCINI

Question 1: I understand that NASA has an agreement extending the option period for the purchase of two additional Transfer Orbit Stage (TOS) vehicles. I understand NASA has agreed to pay an additional $5 million for this extension in the first quarter of FY 1992 or when the options are exercised. Is this correct?

Answer 1: Yes. NASA has entered into a contractual agreement extending the option period for the purchase of two TOS vehicles. NASA has agreed to pay OSC $5 million in consideration for the extension of the option period in the first quarter of FY 1992 or upon exercise of the options(s), whichever occurs earlier. This commitment is conditional upon appropriations being available to NASA for that specific purpose.

Question 2: In last year's Senate report (p. 115), and in my colloquy with Chair Mikulski on the Senate floor last September, concerns were raised about sole source procurement creating potential single-point-of-failure problems. Does NASA have plans to use additional TOS upper stages for other programs such as the Lunar Observer?

Answer 2: Currently, there are three potential programs under consideration that should require an upper stage in the TOS or IUS (Inertial Upper Stage) class: Lunar Observer, a Mars Observer follow-on, and the Advanced TDRS series. As is normally the case at this stage of planning, NASA's Flight Assignment Board (FAB) has not yet considered or made a recommendation on launch vehicles and upper stages for these missions.

Question 3: NASA has planned the procurement of launch vehicle services in the small ELV class under the assumption of a single award for ten launches in the next five years. Is NASA changing its position regarding a single award for the small expendable launch vehicles (SELV) procurement?

Answer 3: No. NASA still anticipates a single award for seven firm, cost plus options for three additional small ELV launch services, and this is reflected in the request for proposals sent to industry.

Question 4: DOD (Advanced Research Projects Agency-DARPA) has successfully tested a new launch system, Pegasus. This is an exciting new capability with great flexibility. Does NASA have plans to utilize this launch system?

Answer 4: Pegasus may be one of several systems competing to fulfill our SELV launch service needs.

Question 5: NASA committed to using two of the remaining six vehicles in the Government inventory of Scout vehicles. It appears that Pegasus is cheaper to fly than Scout. Is this the case? Please provide cost comparisons for the record.

Answer 5: NASA recently issued a request for proposal for Small Expendable Launch Vehicle Services (SELVS). Several systems have been proposed by the commercial industry. A list of potential SELVS suppliers and their vehicles is provided in Enclosure 1. Because this competition is still in progress and final bids have not yet been received, a cost comparison cannot be made at this time. When the successful SELVS contractor is selected in November 1990, we will reassess the trade-off in mission success, availability and cost of using the residual Scout inventory versus the newly competitively selected SELVS to accomplish the NASA missions now planned on Scout. If we find that it is more advantageous to launch the Scout missions on SELVS, we will either return the Scout inventory to the DOD, or excess it.

Commercial Launch Service Providers
Who Met RFP Submittal Date

Company	Vehicle
LTV Missiles and Electronics	Scout, Scout II
Orbital Sciences Corp.	Pegasus, Taurus
Space Services, Inc.	Conestoga II thru V
E-Prime Aerospace Corp.	EPAC S-1 thru S-IV
Lockheed Missile and Space Corp.	Poseidon C3, Liberty
Pempco aeroplex	TBD
Fairchild	TBD

SUBCOMMITTEE RECESS

Senator MIKULSKI. We thank you for this testimony. It's now 12:05. This subcommittee is going to stand in recess until next Tuesday at 2 p.m., when we're going to take the testimony of Secretary Jack Kemp of the Department of Housing and Urban Development.

Thank you very much.

[Whereupon, at 12:05 p.m., Friday, May 4, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

DEPARTMENTS OF VETERANS AFFAIRS AND HOUSING AND URBAN DEVELOPMENT AND INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1991

TUESDAY, MAY 8, 1990

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:09 p.m., in room SD-192, Dirksen Senate Office Building, Hon. Barbara Mikulski (chairman) presiding.

Present: Senators Mikulski, Lautenberg, Fowler, Garn, D'Amato, and Nickles.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

STATEMENT OF JACK KEMP, SECRETARY

ACCOMPANIED BY:

- ALFRED DELLIBOVI, UNDER SECRETARY
- C. AUSTIN FITTS, ASSISTANT SECRETARY FOR HOUSING—FEDERAL HOUSING COMMISSIONER
- MICHAEL JANIS, GENERAL DEPUTY ASSISTANT SECRETARY FOR PUBLIC AND INDIAN HOUSING
- TIMOTHY COYLE, ASSISTANT SECRETARY FOR LEGISLATION AND CONGRESSIONAL RELATIONS
- JOHN WEICHER, ASSISTANT SECRETARY FOR POLICY DEVELOPMENT AND RESEARCH
- MARY BRUNETTE, ASSISTANT TO THE SECRETARY FOR POLICY AND COMMUNICATION
- THOMAS HUMBERT, DEPUTY ASSISTANT SECRETARY FOR POLICY DEVELOPMENT AND RESEARCH
- STEPHEN GLAUDE, DEPUTY UNDER SECRETARY FOR INTERGOVERNMENTAL RELATIONS
- ALBERT J. KLIMAN, DEPARTMENTAL BUDGET OFFICER

OPENING REMARKS OF SENATOR MIKULSKI

Senator MIKULSKI. The subcommittee will come to order. We welcome Housing and Urban Development Secretary Jack Kemp to present the President's 1991 budget for HUD. HUD's request is an increase of $6.5 billion above last year's level.

However, the number is somewhat deceiving because of the large number of section 8 renewals proposed in this year's budget—$7.7

billion in budget authority, which is to meet the existing renewal contracts.

When renewals and mandatory appropriations are factored out of the 1991 budget, the growth over last year is less than $80 million. This increase is hardly an expansion to wage a new war on poverty. In fact, it doesn't even come close to keeping pace with inflation. HUD's own estimates suggest at least 4 million American families either live in housing that's considered substandard or pay more than 50 percent of their monthly income in rent.

At HUD's current rate of funding, it will take until the year 2040 to make sure that each of these families gets decent, affordable housing; and that assumes that no one else will fall into this worst case needs category before then.

While there has been much discussion about HOPE, the President's new housing proposal, I intend to focus today on a more basic issue we face as a subcommittee in 1991—avoiding further erosion in our federally assisted housing stock.

We feel that the preservation of existing housing stock has to be a top priority of this committee. There are as many as 600,000 section 221 and 236 units, whose owners will be eligible to prepay their HUD-backed mortgages and get out of low-income housing later on this year.

Section 8 contract renewals, a subject which this subcommittee tackled head on last year, and now faces a revised HUD estimate of $1 billion less in 1991 than what was said to be the need last fall.

Finally, a sizable cut in public housing modernization in the administration's 1991 budget is a concern due to the absence of any funds to remediate lead-based paint. The need is acute, as there is a backlog in these areas which runs well in excess of $20 billion.

While many eyes focus on new initiatives in 1991, it is my expectation that we will also focus on the basics in our deliberations. The funds for new initiatives have not yet been allocated to this subcommittee, and I do not intend to act on any new proposals unless the President signs into law a new housing bill before we markup our 1991 bill.

ADDITIONAL SUBMITTED STATEMENTS OF SENATORS

Having said that, I recognize Senator Garn for his opening statement, and then we will have Secretary Kemp give his opening statement. We will place in the record any statements that other members may wish to submit.

We will be operating on the first round on the 5-minute rule. I ask that the Senators keep their questions brief, and that Secretary Kemp keeps his answers crisp.

[The statements follow:]

STATEMENT OF SENATOR FRANK R. LAUTENBERG

Thank you, Madam Chair, and welcome, Secretary Kemp.

I want to focus this afternoon on the problem of drugs in public housing.

Mr. Secretary, I don't have to tell you the horrors that public housing tenants often must deal with because of the exploding drug problem.

I've visited projects myself and spoken with residents. All too often, they feel like they're living in a war zone—terrorized by armies of drug dealers and afraid to leave their apartments.

It's an inhuman, intolerable situation, and I think we have an obligation to do something about it.

That's why I developed the Public Housing Drug Elimination Act—to give housing authorities and tenants the tools they need to fight back. As you know, the program is just now getting off the ground, and the first grant awards were made in March.

I'm pleased that the program is off to a very good start. There was a tremendous response from housing authorities around the country. About 500 applied, though there was only $8.2 million available—enough for 37 awards. And, largely because they had to compete for the grants, many housing authorities worked closely with residents and community leaders to put together high quality antidrug plans.

Of course, when only 7 percent of applications are funded, you're left with a lot of unhappy people.

And I think partially as a result, you've faced some criticism for your handling of the program. But I think once we distribute the $97 million available for grants this year, we'll have fewer unhappy housing authorities and things will fall in place.

As you know, the President's budget calls for about a $50 million increase in fiscal year 1991 funding, to $150 million. And I'm going to do all I can to ensure we provide that full amount.

I look forward to working with you and Senator Mikulski—who also has been very supportive of the program in the past—to make that happen.

Statement of Senator Charles E. Grassley

Thank you, Mr. Secretary, for attending today's hearing. I appreciate your taking the time from a very busy schedule to appear before this committee.

I would like to commend Secretary Kemp for the wonderful job he has been doing as head of the Department of Housing and Urban Development. The last year and a half, under the stewardship of Secretary Kemp, HUD has gone through some amazing changes—changes that, frankly, I thought would never occur. He has taken an agency that was operating under a cloud of inefficiency and ineptitude and turned it into an agency that stands ready to aggressively attack some of the problems that plague our nation.

But at the same time that this new attitude comes to HUD, there are still some in this town that decry the efforts of Secretary Kemp. There are some who want business-as-usual. These nay-sayers are more interested in protecting turf than solving the problems of the poor. They are more interested in maintaining failed programs than in empowering individuals. Instead of solving problems, they want to address problems.

That is what we do best in Washington—if there is a problem, the thing to do is to cover it with Band-Aids in the hope that it will go away. But what ends up occurring is that the wound becomes infected until it reaches the critical stage. And when the wound reaches the most critical stage, when action is absolutely essential, when it is obvious to everyone that something must be done—we appoint a blue-ribbon commission to study the problem.

But Secretary Kemp has optimistically and positively developed programs with solutions to the housing and urban development problems of the United States—and I think it is essential that this committee and the entire Congress give Secretary Kemp's ideas the chance to work. Because one thing is for certain—what has been tried in the past has not worked.

Again, thank you for attending today's hearing Mr. Secretary. As always, I look forward to working with you in the year ahead.

Statement of Senator Alphonse D'Amato

Madame Chair, I am pleased to join you today as we discuss the fiscal year 1991 HUD appropriations. I welcome the opportunity to receive the Administration's testimony.

Though there are many important issues before us, there are a few that I would like to specifically address here today. They include: Section 202 Elderly/Handicapped program, Public Housing Drug-Elimination Grants and the Community Development Block Grant.

For fiscal year 1991, the Administration proposes to reduce funding for the 202 construction program from $480 million to $290 million reducing the number of new units from 8,500 to 3,900. It is unacceptable that at a time when this nation is in desperate need of affordable housing that one of the few housing production programs becomes targeted for reductions. The need for this housing is there and will continue to grow as the elderly population continues to grow.

There is another major concern with the 202 program that I want to raise to my colleagues' attention. It is the backlog of 202 projects known as the pipeline. The housing authorizing committee is attempting to address this but I am convinced we are doing nothing more than tinkering around the edges.

According to conservative estimates, there are over 26,000 units of elderly and handicapped housing in the pipeline. That is the equivalent of $1.3 billion of available, yet unbuilt, affordable housing. The State of New York has over 3,800 units (56 projects/$255 million) of elderly housing in the pipeline.

It is essential that in a time when we are in desperate need of affordable housing and when our federal resources are scarce that this is not happening and I ask for support and cooperation on this vital matter.

The Public Housing Drug-Elimination pilot program, established in 1988, awarded $8 million in competitive grants in February of this year. The need for this funding was loudly demonstrated in this first round. There were 496 applications and only funding for 35 grants. Additional appropriations of $98 million will be awarded this fiscal year allowing a much larger portion of public housing authorities nationwide to access these critical funds.

Public Housing Authorities have made it clear that the opportunity offered by this pilot program is essential. It will likely be a year or more before we can assess the impact of these grants. I look forward to continuing to support this program at an increased appropriations level of $150 million and look forward to its positive impact on the families who live in public housing.

The CDBG program is the largest and one of the most important sources of federal funding for states and localities. As total federal assistance to local governments has declined over the last several years, the CDBG has assumed increased importance.

Last year, the CDBG program received an authorization and appropriation of $3 billion. As Ranking Member of the Housing Subcommittee, and as a Member of the VA-HUD-Independent Agencies Appropriations Subcommittee, I was supportive of this funding level. I have and will continue to oppose any effort to reduce funding for this program.

Thank you, Madame Chair.

COMMENTS OF SENATOR GARN

Senator **GARN**. Thank you, Madam Chair. I have no opening statement. I would just welcome the Secretary and his staff, and simply make a comment on the end of your statement about an authorization bill.

Last week the Senate Banking Committee approved a housing authorization bill. We are now in active negotiations with the Secretary to see if we can come to some compromise on that bill that will be agreeable not only to the House and Senate, but the administration as well.

It is everybody's goal to have an agreement in place before we bring the Senate's Banking Committee bill to the floor.

SUMMARY STATEMENT OF SECRETARY KEMP

Secretary **KEMP**. I have two statements, one for the record, which is quite lengthy, and which I would request be submitted for the record, Madam Chair.

Senator **MIKULSKI**. Without objection.

Secretary **KEMP**. Then a briefer statement, and I will try to even make that shorter, because of the time constraints that I understand you are under. I will be here as long as you need me, and would be happy to come back at an appropriate time.

Since I appeared last year before your committee, the well publicized and highly visible problems in HUD's past made it mandatory that we devote a great deal of time and energy to reforming those systemic flaws in HUD's programs and also improving the financial management and accountability of HUD.

I want to thank the Chair, the ranking member, and other key Members of Congress on both sides of the aisle, for the tremendous cooperation in passing the far reaching and sweeping ethics, management, and FHA reforms that were enacted last year with your help. I am grateful for that.

Let me say that in watching television last week on C-SPAN, I was just outraged that a former HUD official would now suggest to you, or to the Congress, that you had better watch HUD, because it is an election year. Madam Chair, you need to know that I have removed politics, and the type of profiteering that took place, for which the gentleman is in jail.

He would never have even gotten the job at HUD under my stewardship. Viewing my commitment publicly, Madam Chair, and to my colleagues in both parties, there will be no room for politics in HUD in an election year, or in a nonelection year.

I want to be watched, and we are being watched, but I can tell you that it is not because it is an election year. We will operate in an election year exactly as we did in the year before, and you have my pledge on that, Madam Chair.

The budget that we have presented you is not only, I believe, responsible, but it is a good faith effort by the administration to help fulfill HUD's basic mission in the areas of affordable housing, and community economic development, fair housing, and equality of opportunity for all people.

It includes what I think is a dramatic new initiative, Madam Chair, to expand opportunities for homeownership, preserve low-income housing, and help create jobs and economic development in our severely distressed urban and rural communities.

We, as you point out, are requesting a total of $23.6 billion in budget authority, and that represents a slight but nonetheless real increase in our discretionary budget authority over 1990, but I don't want the debate over this year's budget to be strictly a debate, Madam Chair, over just budget authority and outlays.

As you pointed out when we came last year and were worried about the continuation of those expiring section 8 contracts, there was a lot of doubt as to whether the administration would fill its commitment, and we are, and we will work with you to iron out the incredibly inefficient and almost impossible accounting problems in the section 8 program.

We are pleased to come before you with a budget that does reflect a commitment that both of us made last year, to comply 100 percent, to those people who would have an expiring section 8 contract.

As Senator Garn pointed out, the administration, and myself, and Dick Darman at OMB, are cooperating with both the House and the Senate, in coming up with a compromise for housing legislation this year. We recognize the critical importance of Housing and Urban Development, and we are committed, along with you on this committee and others, to the type of leadership that can raise the visibility, and the effectiveness, and the research for HUD's programming.

If there is to be flexibility from the administration on funding of housing, we want to make sure that the increased resources would be used for successful antipoverty programs that help low-income people help themselves, and are measured not so much by how many people need the assistance, but how many people can move through assistance and on to the level of opportunity that we call capturing the American dream.

CREATION OF NEW HOMEOWNERS

Last month in Dallas, Madam Chair, I announced a target by the Bush administration, with the cooperation of Congress, to create 1 million new homeowners from the ranks of first-time homebuyers, and low- and moderate-income Americans within 2 years, utilizing a combination of FHA, multifamily homesteading, assisted public housing, and assistance to nonprofits, all designed to empower a broader range of American families from the ranks of lower and moderate income, with the opportunity to achieve the dream of ownership and assets to pass on to their children.

As William Raspberry has pointed out in the Washington Post, you can change behavior by altering attitudes, and attitudes are shaped by the access to property, and access to assets, and access to income.

I have been encouraged by the tremendous response that I have received on behalf of this pledge by the Bush administration. The other evening in Dallas 800 resident managers, and grassroots community leaders, women, and men from public housing all over America, including PHA officials applauded that announcement as a new declaration of independence for low-income residents.

Madam Chair, I want you to know, as I said last year, that I am fully committed to strategies that abandon continued welfare dependency, and instead help promote dignity, opportunity, entrepreneurship, and the pride of ownership and self-esteem, all of which are a part of what I consider to be important elements in the war of poverty.

I don't think we can mention the war on poverty as only a Government spending program. We don't at HUD, and the administration doesn't. I recognize that resources have to be there, and we look forward to working with you on the budget that we are submitting.

I want to make sure that this budget proposal is accompanied by a statement that we need to keep in mind the lessons of last year's performance. By reducing resources for flood programs that led to wasted duplication and abuse, we can build on the success of those existing programs to develop new initiatives, which will enable us to serve more people in a more cost effective way.

HOPE PROGRAM

The primary new initiative, Madam Chair, in this budget is HOPE, homeownership and opportunity for people everywhere. We look forward to working with this committee and other relevant committees in the House and in the Senate on coming up with housing legislation.

In the request is $7.2 billion in total resources for HOPE over the next 3 years. It would fund almost a dozen programs for low-income homeownership; it would assist the homeless and the elderly. HOPE contains proposals for changes in the Tax Code, such as using IRA's for first-time homebuyers, tax incentives and 1-year extensions of low-income housing tax credits, which we believe would produce over 125,000 units of low-income housing in 1991 alone.

We have suggested housing opportunity zones to reduce barriers to development of affordable housing opportunities. Some of these are new and some are not so new, but I wanted you to know that I am pleased that both the House and Senate authorizing committees have made beginnings toward including HOPE in their 1991 legislation.

There will be a lot of negotiations to come, but the goodwill on both sides of the aisle has been manifested continuously by all of the relevant Members.

We have talked about homeownership grants, and we think that multifamily preservation that you mentioned, Madam Chair, is a key component that both Congress and the Bush administration want to work on. We know that there are a lot of different ideas.

But we want to keep ever in front of our eyesight, vision if you will, the chance for people to buy out those developers and keep it in the low-income community, so that homeownership is a major theme in the Bush administration's budget this year as never before.

I want to direct your attention to two other key elements and then stop and answer your questions, Madam Chair. For the first time in the history of any homeless spending program, the Bush administration believes that we must change the direction of the homelessness debate from just shelter, or just bricks and mortar solutions, to a more holistic approach.

It treats men and women, and families with the type of support, services, and care that they deserve along with that shelter. The shelter plus care component of the Bush administration's loan package would provide nearly $250 million in rental assistance for homeless individuals who need the type of care and assistance for any of the problems that they may face, be it mental illness, or a chronic problem with alcohol, or substance abuse, or both.

We share this committee's interest in elderly housing, whether it is congregate housing services, or elderly independence. I am convinced that this administration can work with this committee and the Congress in coming up with congregate housing services, and providing enough money for a demonstration program that would tie the services to independent living associated with voucher assistance for our elderly.

We are committed to section 202, and unlocking the moneys that have been put in the pipeline. As you and Senator D'Amato have pointed out many times, it is outrageous when there is a need for elderly housing in America, that the pipeline was clogged. My staff, and Assistant Secretary for Housing, Austin Fitts, who is behind me, have devoted a lot of time and attention to getting that pipeline unclogged, and we are making a lot of progress on that.

FUNDS FOR ELIMINATING DRUGS IN PUBLIC HOUSING

Ending drug trafficking in public housing is an issue that I know that the Senator from New Jersey, Frank Lautenberg, and many members of this committee are interested in. We only had $8.9 million last year. This year we have asked for $150 million for 1991, and that is compared with $98 million in the 1990 fiscal year.

And we are trying to do a lot better in directing it to cities where there are severe problems. You and I discussed this, and I want you to know that we will do a lot better job in making sure that the cities and the areas that are hard pressed with fighting drugs in public housing get the type of drug elimination grants that matter.

Obviously at this point, I would like to go to your questions, but I did want to get those points on the record, and then submit my statement for your consideration in the record. Thank you.

[The statement follows:]

STATEMENT OF JACK KEMP

MADAM CHAIR AND MEMBERS OF THE SUBCOMMITTEE. I AM PLEASED TO BE HERE BEFORE YOU TO DISCUSS PRESIDENT BUSH'S 1991 BUDGET FOR THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT. THIS BUDGET ADDRESSES THE GREAT GOALS OF HOUSING, HOMEOWNERSHIP, ENTREPRENEURSHIP AND HELP FOR THE HOMELESS THAT PRESIDENT BUSH AND I ARE COMMITTED TO PURSUING AT HUD.

SINCE I APPEARED BEFORE YOU LAST YEAR, THE WELL-PUBLICIZED PROBLEMS IN HUD'S PAST HAVE REQUIRED US TO DEVOTE A GREAT DEAL OF ENERGY TO REFORMING SYSTEMIC FLAWS IN HUD PROGRAMS AND IMPROVING FINANCIAL MANAGEMENT AND ACCOUNTABILITY. TO SOME DEGREE THESE PROBLEMS WERE A BLESSING IN DISGUISE, BECAUSE WE LEARNED THE DEGREE TO WHICH OUR PROGRAMS DESIGNED TO HELP THE POOR HAD BEEN POISONED BY FRAUD, ABUSE AND JUST PLAIN GREED.

I AM OUTRAGED THAT A FORMER HUD OFFICIAL WOULD SUGGEST TO A COMMITTEE OF THE CONGRESS--AS DUBOIS GILLIAM DID LAST WEEK--THAT CONGRESS HAD BETTER WATCH HUD, BECAUSE IT'S AN ELECTION YEAR. MADAM CHAIR, THERE IS NO ROOM FOR POLITICKING AND PROFITEERING AT HUD. YOU CAN BET THAT, ELECTION YEAR OR NON-ELECTION YEAR, PRESIDENT BUSH AND I WILL HAVE ZERO TOLERANCE FOR ANYONE AT HUD WHO WOULD VIOLATE THE PUBLIC TRUST OR WHO WOULD USE THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT AS A POLITICAL SLUSH FUND OR TO LINE THE POCKETS OF FRIENDS, ASSOCIATES OR THEMSELVES.

OUR DEPARTMENT HAS MADE AN EFFORT TO REFORM ITSELF THAT IS PERHAPS UNPRECEDENTED. AND, WITH THE HELP OF THE CONGRESS, WE ARE CARRYING OUT SWEEPING ETHICS, MANAGEMENT AND FEDERAL HOUSING ADMINISTRATION REFORMS TO ENSURE THAT OUR PROGRAMS ARE NEVER AGAIN ABUSED OR MISUSED FOR POLITICAL PURPOSES, EXCESSIVE PROFIT OR PERSONAL GAIN. WE ARE IN A BETTER POSITION TODAY TO ENSURE THAT HUD'S PROGRAMS BENEFIT THOSE IN NEED. THANK YOU FOR YOUR ASSISTANCE IN PASSING H.R. 1 AND FOR PROVIDING RESOURCES TO IMPLEMENT THESE NEEDED REFORMS.

WE BELIEVE THE BUDGET WE ARE PRESENTING TO YOU IS NOT ONLY RESPONSIBLE BUT ALSO A GOOD FAITH EFFORT TO HELP FULFILL HUD'S BASIC MISSION IN THE AREAS OF AFFORDABLE HOUSING, COMMUNITY ECONOMIC DEVELOPMENT, FAIR HOUSING AND EQUAL OPPORTUNITY. IT ALSO INCLUDES A DRAMATIC NEW INITIATIVE TO EXPAND OPPORTUNITIES FOR HOMEOWNERSHIP, PRESERVE LOW-INCOME HOUSING AND HELP CREATE JOBS AND ECONOMIC DEVELOPMENT IN OUR SEVERELY DISTRESSED URBAN AND RURAL COMMUNITIES.

MADAM CHAIR, THE ADMINISTRATION IS REQUESTING A TOTAL OF $23.6 BILLION IN BUDGET AUTHORITY FOR 1991, REPRESENTING A SMALL BUT REAL INCREASE IN THE DEPARTMENT'S DISCRETIONARY BUDGET AUTHORITY OVER 1990. BUT WE DO NOT BELIEVE THAT THE DEBATE OVER THIS YEAR'S BUDGET SHOULD BE STRICTLY A DEBATE OVER BUDGET AUTHORITY AND OUTLAYS. THE ADMINISTRATION, INCLUDING THE OFFICE OF MANAGEMENT AND BUDGET, REALIZES THE CRITICAL IMPORTANCE OF HOUSING AND URBAN DEVELOPMENT, AND WE ARE COMMITTED--ALONG WITH THIS COMMITTEE'S LEADERSHIP--TO RAISING THE VISIBILITY, EFFECTIVENESS AND RESOURCES FOR HUD PROGRAMS. BUT, IF THERE IS TO BE FLEXIBILITY FROM THE ADMINISTRATION ON HOUSING FUNDING, WE WANT TO MAKE SURE, AS I KNOW YOU DO, THAT THOSE INCREASED RESOURCES WILL BE USED FOR SUCCESSFUL ANTI-POVERTY PROGRAMS THAT HELP LOW-INCOME PEOPLE HELP THEMSELVES.

I BELIEVE THE SUCCESS OF OUR HOUSING AND COMMUNITY DEVELOPMENT PROGRAMS SHOULD BE MEASURED NOT JUST BY THE NUMBER OF PEOPLE WE ARE SERVING OR HOW MUCH WE ARE SPENDING. FAR MORE THAN BUDGET AUTHORITY AND MONEY ARE INVOLVED IN THE EMPOWERMENT OF PEOPLE. RATHER, OUR SUCCESS MUST BE JUDGED BY THE NUMBER OF PEOPLE WHO NO LONGER NEED GOVERNMENT ASSISTANCE; BY THE NUMBER OF PEOPLE WHO HAVE BEEN LIFTED UP AND OUT OF DEPENDENCY AND WHO HAVE PRIVATE SECTOR JOBS, INCOME AND OPPORTUNITY TO OWN THEIR OWN HOMES OR HAVE DECENT HOUSING AND SHELTER.

AS THE SENATE AND HOUSE CONSIDER HOUSING AUTHORIZATION LEGISLATION, THE BILLS SHOULD BE KEPT WITHIN PRUDENT BUDGET TARGETS, AND WE ARE ALARMED THAT THE SENATE HOUSING BILL IS ABOUT $4 BILLION OVER THE PRESIDENT'S BUDGET IN 1991 AND $15 BILLION HIGHER CALCULATED OVER 3 YEARS. WE ARE JUST AS CONCERNED, HOWEVER, THAT THE SENATE PROPOSAL WOULD NOT CREATE THE TYPES OF POLICIES THAT WILL GENUINELY HELP POOR PEOPLE REACH SELF-SUFFICIENCY. RATHER, IT CONTINUES TO PROVIDE SCARCE FEDERAL FUNDS FOR THE TYPES OF PROGRAMS THAT DECADES OF FEDERAL EXPERIENCE TELL US ARE EXPENSIVE, BREED SCANDAL, AND ENTRAP--NOT EMPOWER--LOW-INCOME PEOPLE IN AN ENVIRONMENT WITH NO CONTROL, CHOICE OR POWER OVER THEIR OWN LIVES.

WE BELIEVE THAT OUR BUDGET PROPOSAL DOES THAT BY HEEDING THE LESSONS OF LAST YEAR'S REFORMS BY REDUCING RESOURCES FOR FLAWED PROGRAMS THAT HAVE LED TO WASTE, DUPLICATION AND ABUSE. WE ARE ALSO ATTEMPTING TO BUILD ON THE SUCCESSES OF EXISTING PROGRAMS LIKE NEHEMIAH AND CONGREGATE SERVICES, AND DEVELOP NEW INITIATIVES WHICH WILL ENABLE US TO SERVE MORE PEOPLE IN A COST-EFFECTIVE WAY.

IMAGINE, MEMBERS OF THE SUBCOMMITTEE, THAT NOT ONE OF THE 4.5 MILLION FAMILIES NOW BEING SERVED BY OUR HOUSING PROGRAMS MOVES OFF OF GOVERNMENT ASSISTANCE AND INTO SELF-SUFFICIENCY DURING THE REMAINDER OF THIS CENTURY. BY THE YEAR 2000, WE WOULD STILL BE SERVING THE SAME 4.5 MILLION FAMILIES, PLUS ANY OTHERS THAT MIGHT BE REACHED THROUGH ANNUAL INCREMENTAL INCREASES IN ASSISTANCE.

BUT LET'S NOW IMAGINE THAT THROUGH THE EMPOWERMENT AND UPWARD MOBILITY PROGRAMS ENVISIONED IN OUR BUDGET, ONE-QUARTER OF THOSE BEING ASSISTED MOVED OFF OF GOVERNMENT SUPPORT AND INTO SELF-SUFFICIENCY EACH YEAR. BY THE TURN OF THE NEXT CENTURY, WE'D HAVE SERVED ALMOST 16 MILLION FAMILIES--THREE-QUARTERS OF WHOM WOULD HAVE MOVED TO INDEPENDENCE.

THE PRIMARY NEW INITIATIVE CONTAINED IN THE HUD BUDGET IS HOPE--HOMEOWNERSHIP AND OPPORTUNITY FOR PEOPLE EVERYWHERE. THE HOPE INITIATIVE PROPOSES $7.2 BILLION IN TOTAL RESOURCES FOR HOUSING AND URBAN DEVELOPMENT OVER THE NEXT 3 YEARS, INCLUDING $4 BILLION IN BUDGET AUTHORITY, $1.5 BILLION IN TAX EXPENDITURES AND $1.7 BILLION IN MATCHING FUNDS FROM STATES AND LOCALITIES. THIS INITIATIVE WOULD FUND ALMOST A DOZEN PROGRAMS FOR LOW-INCOME HOMEOWNERSHIP AND TO ASSIST THE HOMELESS AND THE ELDERLY. IN ADDITION TO THE GRANT AND SUBSIDY PROGRAMS OF DIRECT INTEREST TO THIS COMMITTEE, HOPE CONTAINS OTHER PROPOSALS, SUCH AS PERMITTING THE USE OF IRAs FOR FIRST TIME HOMEBUYERS; ENTERPRISE ZONE TAX INCENTIVES; A 1-YEAR EXTENSION OF THE LOW-INCOME HOUSING TAX CREDIT, WHICH WILL PRODUCE 125,000 UNITS OF LOW-INCOME HOUSING IN 1991; AND HOUSING OPPORTUNITY ZONES TO REDUCE BARRIERS TO THE DEVELOPMENT OF AFFORDABLE HOUSING OPPORTUNITIES.

THE HOPE INITIATIVE IS THE CORNERSTONE OF A NEW EFFORT TO EMPOWER THE POOR. IT DISAVOWS THE BELIEF THAT POVERTY IS A PERPETUAL CONDITION, THAT THE BEST PEOPLE CAN HOPE FOR IS A LIFE DEPENDENT ON WELFARE. IT ATTEMPTS TO REPLACE THE CYCLE OF POVERTY AND DEPENDENCY WITH THE LADDER OF OPPORTUNITY.

MADAM CHAIR, LET ME ALSO STATE THAT I AM PLEASED BOTH THE HOUSE AND SENATE AUTHORIZING COMMITTEES HAVE MADE BEGINNINGS TOWARD INCLUDING HOPE IN THEIR 1991 LEGISLATION.

FOR 1991, THE FIRST YEAR, THE BUDGET INCLUDES $1.2 BILLION IN APPROPRIATIONS FOR HOPE. THESE FUNDS ARE FOR THE FOLLOWING COMPONENTS:

1. HOPE HOMEOWNERSHIP GRANTS. $250 MILLION IS PROPOSED FOR A NEW PROGRAM OF GRANTS TO ENABLE LOW-INCOME FAMILIES AND TENANTS TO BECOME HOMEOWNERS WITH A STAKE IN THEIR COMMUNITIES. FUNDS WILL BE AVAILABLE FOR RESIDENT HOMEOWNERSHIP IN PUBLIC HOUSING, URBAN HOMESTEADING OF GOVERNMENT-HELD VACANT AND FORECLOSED PROPERTIES, AND FINANCIALLY "DISTRESSED" PROPERTIES HELD IN THE FHA, FARMERS HOME, RTC, AND VA PORTFOLIOS. TWO HUNDRED AND FORTY MILLION OF THE RESIDENT HOMEOWNERSHIP FUNDS WILL REQUIRE MATCHING BY STATES, LOCALITIES OR NONPROFIT ORGANIZATIONS, WHO WILL BE REQUIRED TO PROVIDE $1 FOR EVERY $2 THEY RECEIVE FROM HUD.

MADAM CHAIR, WE BELIEVE THE OPPORTUNITY TO OWN OR CONTROL ONE'S OWN HOME IS THE MOST BASIC FORM OF EMPOWERMENT. IN COMMUNITIES AROUND THIS NATION, NON-PROFITS, NEIGHBORHOOD GROUPS, AND COMMUNITY HOUSING AGENCIES ARE TAKING THE BOARDS OFF VACANT AND FORECLOSED PROPERTY; REHABILITATING THAT PROPERTY, OFTEN THROUGH SWEAT EQUITY; AND TURNING THOUSANDS OF DILAPIDATED HOUSES TO DECENT, QUALITY LOW-INCOME HOUSING. HOPE GRANTS WILL TAP THESE CREATIVE ENERGIES, PRESERVE AND REHABILITATE THE LOW-INCOME HOUSING STOCK, AND MAKE IT AVAILABLE FOR HOMEOWNERSHIP, AND THE PRIDE AND SELF-SUFFICIENCY THAT ENGENDERS.

IN ORDER TO FACILITATE PUBLIC HOUSING HOMEOWNERSHIP IN CONNECTION WITH THE HOPE GRANTS PROGRAM, AND TO PRESERVE LOW-INCOME HOUSING STOCK, A TOTAL OF 6,000 UNITS WOULD BE FUNDED FROM THE ANNUAL CONTRIBUTIONS ACCOUNT FOR RELOCATION, REPLACEMENT OF RENTAL UNITS DUE TO HOMEOWNERSHIP, RENTAL ASSISTANCE FOR NON-PURCHASING TENANTS, AND POST SALE SUBSIDY FOR PURCHASING TENANTS.

2. MULTIFAMILY PRESERVATION AND PREPAYMENT ASSISTANCE. THIS ASPECT OF THE HOPE INITIATIVE PROPOSES $412 MILLION IN FISCAL 1991 TO FUND A THREE-PRONGED APPROACH TO PROTECTING LOW-INCOME RESIDENTS WHO WOULD BE ADVERSELY AFFECTED BY THE MORTGAGE PREPAYMENT OF INSURED PROJECTS. HUD ESTIMATES THAT OVER THE NEXT 15 YEARS, OWNERS OF NEARLY 334,000 UNITS OF FHA-INSURED AND ASSISTED MULTIFAMILY HOUSING WILL BECOME ELIGIBLE TO PREPAY THEIR MORTGAGES, THUS POTENTIALLY ELIMINATING LOW-INCOME USE RESTRICTIONS ON THESE PROPERTIES. WE BELIEVE THAT THE BEST MEANS FOR PRESERVING LOW INCOME HOUSING STOCK, AND AT THE SAME TIME OFFER INCENTIVE AND OPPORTUNITY, IS TO GIVE RESIDENTS THE OPPORTUNITY TO BECOME HOMEOWNERS. THE HOPE PROPOSAL WOULD, ONE, OFFER TENANT GROUPS A 2-YEAR RIGHT-OF-FIRST REFUSAL TO PURCHASE AND CONVERT THEIR BUILDINGS TO HOMEOWNERSHIP; TWO, PROVIDE

INCENTIVES TO OWNERS TO MAINTAIN THE PROPERTY AS LOW-INCOME, IF TENANTS DECIDE NOT TO PURCHASE THE PROJECT; AND, THREE, PROTECT THE TENANTS SHOULD AN OWNER CHOOSE TO PREPAY IN SPITE OF OUR EFFORTS TO CONVERT THE PROJECT TO HOMEOWNERSHIP OR MAINTAIN IT AS LOW-INCOME. THESE PROTECTIONS WOULD INCLUDE REQUIRING PREPAYING OWNERS TO PAY RELOCATION EXPENSES AND 6 MONTHS OF RENTAL COSTS, PLUS A GUARANTEE OF HUD VOUCHERS OR CERTIFICATES FOR ELIGIBLE TENANTS.

MADAM CHAIR, I WANT TO STRESS THAT THE PREPAYMENT OPTION COULD NOT BE EXERCISED UNLESS THERE ARE FUNDS AVAILABLE TO PROTECT THE TENANTS. I WANT TO ASSURE THIS COMMITTEE THAT THE ADMINISTRATION IS COMMITTED TO REQUESTING SUFFICIENT FUNDS TO FINANCE THIS PROGRAM IN FUTURE BUDGETS AS WELL.

3. SHELTER PLUS CARE. THE PROBLEMS OF THE HOMELESS WHO ARE MENTALLY ILL OR SUBSTANCE ABUSERS ARE DEEP-SEATED AND HAVE COMPLEX ORIGINS. THERE IS A NEED--INDEED AN OBLIGATION--TO ADDRESS IN A COMPREHENSIVE WAY THE TRAGEDY OF THOSE WHO ARE HOMELESS IF WE ARE TO BEGIN TO SOLVE THOSE PROBLEMS BOTH EFFECTIVELY AND HUMANELY. THE PROGRAMS OF THE McKINNEY ACT, WHICH PROVIDE EMERGENCY SHELTER OR TRANSITIONAL HOUSING ALONE, DO NOT PROVIDE ALL THE ANSWERS. THE BUSH ADMINISTRATION BELIEVES WE MUST CHANGE THE DIRECTION OF THE DEBATE FROM "BRICKS AND MORTAR" SOLUTIONS TO A HOLISTIC APPROACH THAT COMBINES SUPPORTIVE SERVICES WITH SHELTER. THE "SHELTER PLUS CARE" COMPONENT OF HOPE WILL PROVIDE NEARLY $250 MILLION FOR RENTAL ASSISTANCE TO HOMELESS INDIVIDUALS WHO ARE SERIOUSLY MENTALLY ILL OR HAVE CHRONIC PROBLEMS WITH ALCOHOL, OTHER DRUGS, OR BOTH. THE PROGRAM IS DESIGNED TO PROVIDE HOMELESS INDIVIDUALS WITH THE HOUSING AND SUPPORTIVE SERVICES THEY NEED TO RESTORE THEIR CHANCE TO LIVE NORMAL AND DIGNIFIED LIVES.

THE "SHELTER PLUS CARE" COMPONENT OF HOPE IS COMPRISED OF THE FOLLOWING:

1. RENTAL HOUSING ASSISTANCE FOR THE HOMELESS, A 5-YEAR FLEXIBLE RENTAL ASSISTANCE PROGRAM FUNDED AT $160 MILLION FOR 6,600 UNITS.

2. MODERATE REHABILITATION SINGLE ROOM OCCUPANCY PROGRAM (SRO), WHICH INCLUDES ALMOST $50 MILLION OUT OF THE APPROPRIATION FOR ANNUAL CONTRIBUTIONS FOR 1,305 SRO UNITS.

3. SECTION 202(h) PROGRAM FOR THE HANDICAPPED. A TOTAL OF $35.8 MILLION WILL BE SET ASIDE UNDER SECTION 202(h) FOR A PROGRAM OF 5-YEAR PROJECT-BASED ASSISTANCE IN GROUP HOMES OR INDEPENDENT LIVING UNITS.

4. HOPE FOR ELDERLY INDEPENDENCE. WE BELIEVE, AS YOU DO, MADAM CHAIR, THAT SUPPORTIVE SERVICES ARE EQUALLY VALUABLE TO MANY ASSISTED ELDERLY FAMILIES IN ORDER TO PREVENT THEIR PREMATURE INSTITUTIONALIZATION. CONGRESS HAS PREVIOUSLY SHOWN ITS INTEREST IN THIS APPROACH BY FUNDING, ON A LIMITED BASIS, THE CONGREGATE SERVICES PROGRAM. THE HOPE INITIATIVE BUILDS ON THE CONCEPT OF THE CONGREGATE SERVICES PROGRAM BY PROVIDING $10 MILLION FOR A DEMONSTRATION PROGRAM FOR

SERVICES FOR INDEPENDENT LIVING ASSOCIATED WITH VOUCHER ASSISTANCE FOR THE ELDERLY. THIS DEMONSTRATION WILL INVOLVE 1,500 VOUCHERS USING $34 MILLION UNDER SECTION 8 OUT OF THE APPROPRIATION FOR ANNUAL CONTRIBUTIONS.

MADAM CHAIR, BESIDES PROPOSING NEW INITIATIVES TO EXPAND AFFORDABLE HOUSING OPPORTUNITIES AND PROMOTE ECONOMIC SELF SUFFICIENCY, OUR 1991 BUDGET PROPOSALS REFLECT OUR CONTINUED COMMITMENT TO IMPROVING THE QUALITY OF PUBLIC HOUSING, PROVIDING LOCALITIES WITH COMMUNITY DEVELOPMENT ASSISTANCE, ENFORCING FAIR HOUSING FOR ALL, ASSISTING LOW-INCOME FAMILIES WITH RENTAL HOUSING, AND MAKING PUBLIC HOUSING DRUG-FREE.

THE 1991 BUDGET, OVERALL, PROPOSES $13.4 BILLION FOR ASSISTED HOUSING, WHICH WOULD INCREASE OUR HOUSING ASSISTANCE TO POOR FAMILIES BY MORE THAN 82,000 UNITS, 7,000 MORE THAN CONGRESS APPROPRIATED IN FY 1990. THIS INCLUDES ABOUT 48,000 VOUCHERS, 8,000 CERTIFICATES, 7,000 SECTION 202 ELDERLY UNITS FOR THE ELDERLY AND HANDICAPPED, AND 11,250 UNITS RELATED TO OUR PRESERVATION AND PROPERTY DISPOSITION PROPOSALS.

TENANT BASED ASSISTANCE THROUGH VOUCHERS AND CERTIFICATES IS A KEY COMPONENT OF OUR RENTAL HOUSING STRATEGY FOR LOW-INCOME PEOPLE. AN IMPORTANT LESSON THAT HAS BEEN REINFORCED TO ME DURING THIS PAST YEAR AT HUD IS THE VAST SUPERIORITY OF TENANT-BASED CERTIFICATES AND VOUCHERS--COUPLED WITH PRIVATE SECTOR INCENTIVES THROUGH THE TAX CODE--OVER SUBSIDIZED NEW CONSTRUCTION PROGRAMS IN WHICH AT LEAST A THIRD OF THE BENEFIT GOES TO THE DEVELOPER, THE SYNDICATOR AND THE LAWYER, RATHER THAN TO THE POOR PEOPLE WE SHOULD BE HELPING.

MADAM CHAIR, FEDERAL NEW CONSTRUCTION PROGRAMS HAVE CONSISTENTLY PROVEN TO BE FAR LESS EFFICIENT PER PERSON AND PER UNIT THAN TENANT-BASED ASSISTANCE. WE CAN SERVE FAR MORE NEEDY PEOPLE, MORE QUICKLY, WITH $1 BILLION SPENT ON VOUCHERS THAN WE CAN BY SPENDING A COMPARABLE AMOUNT FOR NEW CONSTRUCTION.

OUR EXPERIENCE WITH PAST NEW CONSTRUCTION PROGRAMS IS THAT THEY'RE EXPENSIVE; THEY BREED SCANDAL; THEY DEVELOP PHYSICAL AND FINANCIAL PROBLEMS AND HUD HAS TO BAIL THEM OUT; AND THEY REALLY DON'T HELP POOR PEOPLE. SINCE 1960, WE'VE HAD THREE SUCCESSIVE GENERATIONS OF NEW CONSTRUCTION PROGRAMS; ULTIMATELY, ALL OF THEM HAVE FAILED, AND WE ARE STILL PAYING FOR OUR MISTAKES. WE DO NOT DENY THE NEED FOR NEW HOUSING PRODUCTION IN SOME MARKETS, BUT WE BELIEVE THAT THE INCENTIVE-ORIENTED LOW-INCOME HOUSING TAX CREDIT, WHICH WILL PRODUCE UP TO 125,000 UNITS OF HOUSING IN 1991, IS THE APPROPRIATE RESPONSE TO THAT NEED.

MADAM CHAIR, AS I INDICATED EARLIER THIS BUDGET ALSO REAFFIRMS OUR COMMITMENT TO CONTINUE PROTECTING FAMILIES IN NEED WHO NOW RECEIVE HOUSING ASSISTANCE THROUGH THE SECTION 8 PROGRAM. NO FAMILY WILL LOSE ITS HOME BECAUSE OF EXPIRING CONTRACTS. OUR BUDGET REFLECTS THAT VERY SIGNIFICANT AND COSTLY COMMITMENT--OVER $7.7 BILLION IN BUDGET AUTHORITY IN 1991, AN INCREASE OF $6.6 BILLION OVER 1990.

I KNOW THAT THIS COMMITTEE IN PARTICULAR HAS BEEN CONCERNED OVER OUR INABILITY TO FORECAST THE LEVEL OF CONTRACT RENEWAL NEEDS. WHEN I GOT TO HUD LAST YEAR, I WAS SHOCKED TO DISCOVER THAT THE DEPARTMENT'S DATA SYSTEMS WERE IN SUCH DISARRAY THAT THERE WAS

VIRTUALLY NO WAY OF TRACKING IN OUR ACCOUNTING SYSTEM EXACTLY WHAT LEVEL OF FUNDING WOULD BE NEEDED TO ENSURE UNINTERRUPTED ASSISTANCE TO NEEDY HOUSEHOLDS. THE TASK FORCE THAT I ESTABLISHED UNDER THE DIRECTION OF UNDER SECRETARY DELLIBOVI IDENTIFIED THE SCOPE OF THE SECTION 8 ACCOUNTING SYSTEM WEAKNESSES. AS I INFORMED YOU ON FEBRUARY 1, 1990, MADAM CHAIR, THE TASK FORCE CONCLUDED THAT A MAJOR OVERHAUL OF PAYMENTS PROCEDURES WAS NEEDED AS PART OF OUR SECTION 8 SYSTEMS REFORM. WE HAVE NOW EMPLOYED AN INDEPENDENT CONTRACTOR TO DESIGN THE APPROPRIATE NEW SYSTEM FOR MANAGING THE SECTION 8 ACCOUNTING PROGRAM, AND WE ARE MAKING SIGNIFICANT PROGRESS TO IMPLEMENT THE "FIX" THAT THIS PROGRAM NEED.

MADAM CHAIR, I BELIEVE THE EXPIRING CONTRACTS ISSUE IS A PRIME EXAMPLE OF THE NEW SPIRIT OF COOPERATION BETWEEN THE LEGISLATIVE BRANCH AND HUD. I WANT TO THANK YOU FOR YOUR PERSONAL INTEREST IN THIS MATTER AND THE TIME YOU TOOK TO HELP ENSURE THAT THERE WILL BE A CONTINUING STREAM OF SECTION 8 ASSISTANCE FOR FAMILIES IN NEED.

THE BUDGET INCLUDES NEARLY 7,000 INCREMENTAL UNITS FOR THE ELDERLY AND HANDICAPPED. HALF OF THESE UNITS ARE UNDER THE SECTION 202 PROGRAM AND INVOLVE NEW CONSTRUCTION. WE ARE FURTHER PROPOSING 3,000 UNITS OF LEASED HOUSING UNDER THE APPROPRIATION FOR ANNUAL CONTRIBUTIONS--1,700 SECTION 8 UNITS FOR THE ELDERLY AND 1,300 SECTION 162 UNITS FOR THE HANDICAPPED. MADAM CHAIR, WE BELIEVE THAT ADDING A LEASED HOUSING COMPONENT WILL HOUSE PEOPLE FASTER THAN NEW CONSTRUCTION IN AREAS WHERE A SUFFICIENT SUPPLY OF HOUSING ALREADY EXISTS AND PROVIDE SPONSORS WITH INCREASED FLEXIBILITY TO MEET THE NEEDS OF THEIR ELDERLY AND HANDICAPPED POPULATIONS. WE ARE ALSO REQUESTING THAT 1,000 OF THESE UNITS BE SET ASIDE FOR THE CHRONICALLY MENTALLY ILL AS A PART OF THE HOPE INITIATIVE.

WE HAVE ALSO BEGUN TO DEAL WITH THE PROBLEM OF THE BACKLOG IN PROJECTS IN THE SECTION 202 PROGRAM. WE CANNOT AFFORD TO HAVE PEOPLE UNASSISTED WHILE FUNDS THAT HAVE ALREADY BEEN APPROPRIATED ARE TIED UP IN BUREAUCRACY. MADAM CHAIR, LAST DECEMBER I REPORTED TO THE APPROPRIATIONS COMMITTEES ON THE STEPS WE WERE TAKING TO ELIMINATE THE SECTION 202 CONSTRUCTION BACKLOG. WE WILL CONTINUE TO IMPLEMENT REGULATORY AND ADMINISTRATIVE CHANGES AS REQUIRED TO UNCLOG THE PIPELINE AND TO ELIMINATE IT ENTIRELY. THIS YEAR WE ARE SHIFTING $55 MILLION OF LOAN FUNDS AND $100 MILLION OF SUBSIDY DOLLARS TO FUND AMENDMENTS. FOR 1991, WE ARE PROPOSING TO USE $75 MILLION FOR THE SAME PURPOSE, TO SPEED UP ALREADY APPROVED PROJECTS IN THE PIPELINE AND SIGNIFICANTLY INCREASE THE NUMBER OF STARTS.

THE BUDGET INCLUDES A $75 BILLION CREDIT LIMITATION FOR THE FHA MORTGAGE INSURANCE PROGRAMS. THIS AMOUNT WILL BE AMPLE TO MEET OUR MORTGAGE INSURANCE COMMITMENT REQUIREMENTS IN 1991. OF IMMEDIATE IMPORTANCE, HOWEVER, IS THIS ADMINISTRATION'S COMMITMENT TO ENSURE THE LONG-TERM FINANCIAL SOLVENCY OF THE FHA FUND. THE HUD REFORMS ENACTED LAST DECEMBER REPRESENT A CRUCIAL FIRST STEP TO GET FHA BACK INTO ITS HISTORIC MANDATE OF BENEFITTING FIRST-TIME HOMEBUYERS. IN DOING SO, HOWEVER, WE HAVE HAD TO GET OUT OF THE BUSINESS OF TAKING INORDINATE FINANCIAL RISKS FOR PROGRAMS OF LIMITED OR NO PUBLIC POLICY BENEFIT, SUCH AS MORTGAGE INSURANCE FOR LAND DEVELOPMENT AND LOANS FOR SPECULATORS, WHICH HAVE THREATENED THE FINANCIAL SOUNDNESS OF THE FHA.

OUR BUDGET ASSUMES THAT THE FHA MORTGAGE CEILING IN HIGH COST AREAS WILL CONTINUE AT ITS CURRENT LEVEL IN FISCAL 1991. HOWEVER, I WANT TO REMIND THE COMMITTEE THAT THE CONTINUATION OF FHA LOSSES PROJECTED IN THIS BUDGET DEMONSTRATES THE NEED FOR ADDITIONAL CHANGES TO MAINTAIN THE SOLVENCY OF THE SINGLE FAMILY MORTGAGE INSURANCE PROGRAM. FOR THAT PURPOSE WE HAVE UNDERTAKEN A MAJOR ACTUARIAL STUDY OF THE FHA MUTUAL MORTGAGE INSURANCE FUND TO ADDRESS FHA'S LONG TERM FINANCIAL PROBLEMS. I KNOW THAT THIS COMMITTEE LOOKS FORWARD TO THE COMPLETION OF THAT STUDY AND OUR PRESENTATION OF SPECIFIC RECOMMENDATIONS FOR MAJOR OR LONG-TERM CHANGES IN THE FHA INSURANCE PROGRAM. OUR PROPOSALS WHICH WE WILL SUBMIT TO CONGRESS AT THE EARLIEST POSSIBLE TIME, WILL BE AIMED AT MAINTAINING A SAFE AND SOUND FUND THAT BENEFITS THOSE IN THE MARKET WHO NEED FHA MOST.

THE BUDGET ALSO INCLUDES $80 BILLION AS A CREDIT CEILING FOR GNMA'S MORTGAGE-BACKED SECURITIES PROGRAM. THIS PROGRAM CONTINUES TO BE AN IMPORTANT MEANS OF ATTRACTING NON-TRADITIONAL INVESTORS IN HOME MORTGAGES, WHICH HELPS TO LOWER INTEREST RATE COSTS FOR MODERATE-INCOME HOMEBUYERS. THE GNMA LIMITATION FULLY COVERS THE EXPECTED GUARANTEE LEVELS FOR 1991, BASED ON FHA AND VA ESTIMATES OF MORTGAGE INSURANCE AND LOAN GUARANTEE ACTIVITY.

FOR PUBLIC HOUSING WE ARE REQUESTING $1.8 BILLION FOR REHABILITATION AND MODERNIZATION--DOUBLE LAST YEAR'S REQUEST. WE REALIZE THAT MEETING THE NEEDS OF PUBLIC HOUSING MODERNIZATION IS A GREAT CHALLENGE, AND WE ALSO REALIZE THAT OUR $1.8 BILLION PROPOSAL WILL NOT CURE ALL OF OUR MODERNIZATION NEEDS. WHILE WE ARE COMMITTED TO CONTINUE FUNDING MODERNIZATION, WE MUST IMPROVE THE PROGRAM AND ELIMINATE THE $3.4 BILLION BACKLOG OF MODERNIZATION FUNDS PREVIOUSLY APPROPRIATED BUT NOT YET SPENT. IN ADDITION TO THE TECHNICAL ASSISTANCE THAT CAN BE PROVIDED FOR THIS PURPOSE UNDER THE HOPE INITIATIVE, WE ARE ALSO REQUESTING AS PART OF OUR BUDGET FOR MODERNIZATION $5 MILLION TO PROVIDE RESIDENT MANAGEMENT TECHNICAL ASSISTANCE AND TRAINING TO RESIDENT MANAGEMENT CORPORATIONS AND COUNCILS TO HELP DEVELOP RESIDENT MANAGEMENT CAPABILITY AND ASSIST IN THE REVITALIZATION OF OUR INNER CITIES.

FINALLY, WE ARE REQUESTING OVER $1.8 BILLION FOR PUBLIC HOUSING OPERATING SUBSIDIES IN 1991, WHICH WILL FULLY FUND OUR EXPECTED COMMITMENTS NEXT YEAR. I INTEND TO LAUNCH A PROGRAM CALLED "OPERATION OCCUPANCY" WHICH WOULD PROVIDE PUBLIC HOUSING OPERATING SUBSIDIES ONLY FOR THOSE UNITS THAT ARE OCCUPIED, THUS ELIMINATING A PERVERSE INCENTIVE THAT EXISTS IN PUBLIC HOUSING TODAY WHERE VACANT UNITS ARE REWARDED WITH OPERATING SUBSIDIES.

ELIMINATING THE SCOURGE OF DRUGS IN PUBLIC HOUSING IS ONE OF THIS ADMINISTRATION'S TOP PRIORITIES. OUR BUDGET REQUEST FOR PUBLIC HOUSING DRUG ELIMINATION GRANTS IS BEING INCREASED TO $150 MILLION, COMPARED WITH $98 MILLION AVAILABLE TO US THIS YEAR. WE ARE ASKING FOR THIS AS A SEPARATE APPROPRIATION IN 1991. LET ME ASSURE THE COMMITTEE THAT WE INTEND TO LEARN FROM THE SHORTCOMINGS OF THE 1989 FUNDING ROUND AND TO ALLOCATE PUBLIC HOUSING DRUG ELIMINATION GRANTS IN A MANNER WHICH WILL ENSURE A BETTER AND MORE EFFECTIVE DISTRIBUTION OF FUNDS. MADAM CHAIR, LET ME ADD THAT PUBLIC HOUSING AUTHORITIES MAY ALSO USE MODERNIZATION FUNDS FOR SECURITY IMPROVEMENTS AGAINST DRUGS AND DRUG TRAFFICKERS.

A KEY PART OF OUR PUBLIC HOUSING ANTI-DRUG EFFORT IS THE PROCESS OF STREAMLINING AND EXPEDITING EVICTION PROCEDURES FOR THOSE WHOSE

DRUG-RELATED ACTIVITY THREATENS THE HEALTH AND SAFETY OF OTHER TENANTS. FOR MORE THAN A YEAR, WE HAVE BEEN REVIEWING STATE EVICTION LAWS TO DETERMINE WHETHER ADEQUATE DUE PROCESS EXISTS TO ALLOW US TO WAIVE FEDERAL DUE PROCESS REQUIREMENTS. WE HAVE GRANTED WAIVERS IN ABOUT 40 STATES SO FAR.

WHILE WE AGGRESSIVELY PURSUE OUR OBJECTIVE TO ERADICATE DRUGS FROM PUBLIC HOUSING, HOWEVER, WE WILL BE JUST AS STRONG ON DUE PROCESS. NO TENANT MAY BE EVICTED WITHOUT THE OPPORTUNITY FOR A FAIR HEARING IN COURT. FURTHER, I HAVE DIRECTED PUBLIC HOUSING AUTHORITIES TO USE DISCRETION IN DETERMINING THE SERIOUSNESS OF AN OFFENSE, PARTICIPATION BY OTHER FAMILY MEMBERS, THE SITUATION AT THE PROJECT IN QUESTION, AND THE EFFECTS OF EVICTION ON OTHER FAMILY MEMBERS.

LEGAL CHALLENGES BY SPECIAL INTEREST GROUPS TO OUR LEASE AND GRIEVANCE POLICY ARE INEVITABLE. WE BELIEVE, HOWEVER, THAT OUR POLICY IS ON SOUND LEGAL FOOTING, AND IT WILL NOT BECOME A REVOLVING DOOR OF EVICTION, FOLLOWED BY COURT CHALLENGE, FOLLOWED BY REINSTATEMENT IN PUBLIC HOUSING. MADAM CHAIR, I STRONGLY URGE THIS COMMITTEE TO REFRAIN FROM PLACING IN THIS OR ANY APPROPRIATIONS BILL ANY LANGUAGE WHICH WOULD HAVE THE EFFECT OF DESTROYING THE RESPONSIBLE BALANCE WE HAVE STRUCK BETWEEN THE RIGHTS OF DRUG OFFENDERS AND THOSE WHOSE HEALTH AND SAFETY IS AFFECTED BY THEIR ACTIONS.

LAST YEAR, WE FULFILLED OUR COMMITMENT TO SEEK FULL FUNDING OF THE McKINNEY ACT. THE PRESIDENT'S 1991 BUDGET PROPOSES TO CONTINUE FUNDING THE McKINNEY ACT PROGRAMS AT MORE THAN THE PREVIOUSLY AUTHORIZED LEVELS. FOR HUD'S HOMELESS PROGRAM ACTIVITIES WE ARE REQUESTING A TOTAL OF $461 MILLION, COMPARED WITH $284 MILLION IN 1990. THIS INCLUDES $247 MILLION UNDER THE HOPE "SHELTER PLUS CARE" PROGRAM TO PROVIDE RENTAL HOUSING ASSISTANCE FOR THE HOMELESS, THE CHRONICALLY MENTALLY ILL HOMELESS, AND FOR SINGLE ROOM OCCUPANCY UNITS. IT INCLUDES ALSO $71 MILLION FOR THE EMERGENCY SHELTER GRANTS PROGRAM AND $144 MILLION FOR TRANSITIONAL AND SUPPORTIVE HOUSING.

TO PUT THE BUDGET FOR HOMELESS PROGRAMS INTO PERSPECTIVE, THE ADMINISTRATION IS REQUESTING NEARLY $1 BILLION FOR ALL McKINNEY AND NON-McKINNEY ACT PROGRAMS, AN INCREASE OF APPROXIMATELY 22 PERCENT ABOVE 1990.

WE ARE REQUESTING AN APPROPRIATION FOR THE COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG) PROGRAM OF $2.8 BILLION. THIS AMOUNT IS ABOUT $163 MILLION LESS THAN THAT MADE AVAILABLE TO US BY CONGRESS FOR 1990. IN PART, THE LOWER AMOUNT REFLECTS THE ELIMINATION OF THE MUCH ABUSED SECRETARY'S DISCRETIONARY FUND AS A PART OF H.R. 1, THE HUD REFORM ACT.

OUR CDBG BUDGET REFLECTS ONE IMPORTANT CHANGE MANDATED IN THE HUD REFORM ACT OF 1989, WHICH DESIGNATES INDIAN TRIBES AS ENTITLEMENT COMMUNITIES BEGINNING IN 1991. I APPRECIATE YOUR INCLUDING IN THE SUPPLEMENTAL APPROPRIATION A NECESSARY TECHNICAL AMENDMENT TO THE REFORM ACT WHICH WILL ENSURE THAT INDIAN TRIBES WILL CONTINUE TO BE ELIGIBLE FOR COMMUNITY DEVELOPMENT ASSISTANCE IN 1990, UNTIL THIS CHANGE BECOMES EFFECTIVE.

FINALLY, WE ARE PROPOSING TO IMPROVE TARGETING OF CDBG FUNDS TO PROJECTS BENEFITTING LOW-AND MODERATE-INCOME PEOPLE AND TO REQUIRE AGENCIES RECEIVING THOSE FUNDS TO DEVELOP STRATEGIES FOR USING THE MONEY TO FIGHT POVERTY.

TO GIVE FURTHER SUPPORT TO MY GOAL OF EXPANDING RESIDENT OWNERSHIP AS WELL AS PRESERVING INNER CITY NEIGHBORHOODS, WE HAVE QUADRUPLED LAST YEAR'S REQUEST FOR THE URBAN HOMESTEADING PROGRAM. TO SUPPLEMENT THE REGULAR PROGRAM THIS YEAR, WE ARE PROPOSING TO TRANSFER $11.4 MILLION OF UNOBLIGATED UDAG BALANCES TO SUPPORT THE HOMESTEADING OF ADDITIONAL FHA PROPERTIES. THIS IS CONSISTENT WITH OUR POLICY OF HELPING TO INCREASE HOMEOWNERSHIP OPPORTUNITIES FOR LOW-INCOME PERSONS. WHILE THIS REQUEST WAS INCORPORATED IN THE HOUSE-PASSED VERSION OF IN THE FISCAL 1990 SUPPLEMENTAL APPROPRIATION, I REGRET, MADAM CHAIR, THAT THE SENATE DID NOT INCLUDE THE PROVISION IN ITS VERSION OF THE BILL.

THE BUDGET PROPOSES AN APPROPRIATION OF $70 MILLION FOR THE RENTAL REHABILITATION GRANTS PROGRAM IN 1991. WE ARE RE-EVALUATING THIS PROGRAM AND LOOKING FOR WAYS TO BETTER TARGET AND MAKE IT MORE EFFECTIVE. WE ARE PROPOSING TO GIVE ADDITIONAL RENTAL REHABILITATION FUNDS TO COMMUNITIES WITH DESIGNATED "HOUSING OPPORTUNITY ZONES" ESTABLISHED IN CONJUNCTION WITH THE HOPE INITIATIVE. WE WANT TO PROVIDE INCENTIVES TO COMMUNITIES TO IDENTIFY AND REMOVE BARRIERS TO THE PRODUCTION OF AFFORDABLE HOUSING.

UNDER PRESIDENT BUSH, ENFORCEMENT OF THE FAIR HOUSING ACT IS A PRIMARY GOAL OF HUD. WE ARE ASKING FOR CONTINUED FUNDING FOR THE FAIR HOUSING ASSISTANCE AND FAIR HOUSING INITIATIVES PROGRAMS IN 1991. THESE PROGRAMS SUPPLEMENT THE FAIR HOUSING ENFORCEMENT ACTIVITIES CARRIED OUT BY HUD STAFF IN THE FIELD. THEY PROVIDE ASSISTANCE TO STATES AND LOCALITIES AS WELL AS TO PRIVATE ORGANIZATIONS, SUPPORTING ENFORCEMENT, COMPLIANCE AND EDUCATIONAL EFFORTS. I WANT TO POINT OUT, IN PARTICULAR, OUR STAFFING NEEDS FOR THE FAIR HOUSING PROGRAMS IN 1991--WE ARE ASKING FOR 762 STAFF-YEARS IN FHEO, AN INCREASE OF 66 OVER 1990. SINCE NEW LEGISLATION IN 1988 EXPANDED THE CATEGORIES OF DISCRIMINATION TO INCLUDE HANDICAP AND FAMILIAL STATUS, OUR WORKLOAD, MANDATED UNDER THE LAW, HAS EXPANDED GREATLY.

THE HUD REFORM ACT AUTHORIZES AN APPROPRIATION OF $25 MILLION TO CARRY OUT AN EXPANDED AGENDA OF EVALUATION AND MONITORING OF OUR PROGRAMS. WE ARE PROPOSING, INSTEAD, THE TRANSFER OF THAT AMOUNT FROM SELECTED APPROPRIATIONS IN 1991. WE BELIEVE THAT IMPROVED MONITORING OF HUD PROGRAMS IS ESSENTIAL IF WE ARE TO AVOID A RECURRENCE OF PROBLEMS LIKE THOSE WE EXPERIENCED IN THE PAST. THIS FUNDING WOULD BE IN ADDITION TO THE $23 MILLION REQUESTED FOR THE RESEARCH AND TECHNOLOGY APPROPRIATION.

THE BUDGET PROPOSES $844.3 MILLION FOR SALARIES AND ADMINISTRATIVE EXPENSES OF THE DEPARTMENT, INCLUDING $389 MILLION IN TRANSFERS FROM THE FHA FUNDS. THE TOTAL INCLUDES $37.8 MILLION FOR THE OFFICE OF INSPECTOR GENERAL AND $806.5 MILLION FOR THE REST OF THE DEPARTMENT. THIS IS AN INCREASE OF $82 MILLION ABOVE THE AMOUNT WE HAVE AVAILABLE IN 1990, AND WILL SUPPORT AN ADDITIONAL 725 STAFF-YEARS OVER THIS YEAR. THE INCREASE IS IMPORTANT IF WE ARE TO BETTER SERVE THE POOR AND THOSE IN NEED WHO DEPEND ON HUD PROGRAMS. IT IS NECESSARY, TOO, IF WE ARE TO IMPLEMENT FULLY AND SWIFTLY THE REFORMS ENACTED AS PART OF H.R. 1. THE ESTIMATE INCLUDES AN INCREASE OF

460 STAFF-YEARS FOR HOUSING PROGRAMS. WE HAVE ALSO ASKED FOR INCREASES FOR THE ADMINISTRATIVE LAW JUDGE IN DEPARTMENTAL MANAGEMENT, THE GENERAL COUNSEL'S OFFICE AND FIELD LEGAL SERVICES TO SUPPORT THE EXPANDED WORK UNDER THE FAIR HOUSING PROGRAM. THE INCREASE ALSO INCLUDES MORE STAFF FOR THE OFFICE OF INSPECTOR GENERAL.

FINALLY, MADAM CHAIR THE SALARIES AND EXPENSES ITEM INCLUDES $34 MILLION FOR INCREASED ADP COSTS. THESE ARE ESSENTIAL IF WE ARE TO IMPROVE THE FINANCIAL MANAGEMENT SYSTEMS OF THE DEPARTMENT, IMPROVE OUR ABILITY TO GET TIMELY AND DEPENDABLE DATA, AND BE ABLE TO MANAGE THE REFORMS WE HAVE INITIATED.

MADAM CHAIR, WE BELIEVE OUR BUDGET IS A BALANCED AND BROAD-BASED PROPOSAL WHICH WILL MEET OUR CONTINUING NEEDS AND ALSO MOVE PEOPLE UP AND OUT OF DESPAIR AND DEPENDENCY BY PROVIDING TOOLS FOR ECONOMIC AND SOCIAL SELF-SUFFICIENCY.

THE ADMINISTRATION IS COMMITTED TO WORKING WITH CONGRESS ON PRODUCING LANDMARK HOUSING LEGISLATION. AND I BELIEVE THIS COMMITTEE AND OTHERS WILL BE SURPRISED BY HOW FLEXIBLE, INDEED AUDACIOUS, WE WILL BE ON FUNDING, IF THIS CONGRESS CREATES GOOD AND WORTHWHILE PROGRAMS. IN SHORT, I BELIEVE THAT ALL THE INGREDIENTS CAN BE IN PLACE FOR FAR REACHING HOUSING LEGISLATION, IF WE DON'T REPEAT THE MISTAKES OF THE PAST, AND INSTEAD OFFER NEW INCENTIVES AND NEW APPROACHES TO UNLEASH THE POOR FROM AGE OLD BONDS OF POVERTY AND HOPELESSNESS.

PRESERVATION OF EXISTING HOUSING

Senator **Mikulski**. Thank you very much, Secretary Kemp. We very much want to discuss your new initiatives and the HOPE program, and, of course, the positions that I know have been of particular interest to you, like getting drugs out of public housing.

I would like to focus my first round of questions, on the preservation of existing housing stock. As you know, last year we went through the rather torturous assessment of real need for expiring section 8 contracts.

I would like to talk first about section 8, and then about expiring contracts in other categories. Last year, as you know, we had the issue of data management, underestimates, and so on. What is HUD's progress in this area?

I noticed that you designated Mr. DelliBovi to assume responsibility for this. Let's start with the status of the data management and the reliability of the estimates that you have for the $7.7 billion for preservation of existing housing stock.

Secretary **Kemp**. Madam Chair, could I have Mr. DelliBovi and Mr. Kliman address this issue specifically with regard to the question that you asked?

Senator **Mikulski**. Yes; I know that it is very technical and I know that Mr. DelliBovi has the responsibility for this area.

Secretary **Kemp**. Yes; and Mr. Al Kliman and Ms. Austin Fitts have also been involved in this. We appreciate very much the cooperation of your office and the subcommittee staff, and note the incredible lack of detail which HUD has on this program.

Mr. **DelliBovi.** Madam Chair, late in 1989, when we were realizing that the data base was worse than we had imagined, we contracted with Arthur Andersen & Co. to do a total study and make recommendations to us.

The first phase of that study, which will provide an independent assessment of the problems in the multifamily assisted housing programs and their tentative solutions, is due to us in the next couple of weeks. Phase two, which will provide solutions and an implementation plan, will follow.

In two of our field offices, we have a pilot program to collect the data, correct the forms, and prepare for the automation of the data base. That is ongoing, and I believe that within about 6 months, all of our field offices should be in a position to enter the information we need into a data base that can be used for program analysis. However, it is going to be a massive effort to enter all of that information into the data base.

As I said, it is being done now on a pilot basis in two of the offices.

Senator **Mikulski.** Mr. Kliman, did you want to add to that?

Mr. **Kliman.** No; I think that the Under Secretary has stated the situation quite well.

Senator **Mikulski.** Mr. DelliBovi, has your error rate on renewals, which was about 9 percent last fall, improved since then?

Mr. **DelliBovi.** No; it has not. The information that we have is so poor that it is really hard to say with certitude how good or how bad it is. We just simply do not know.

ESTIMATES FOR SECTION 8 RENEWALS

Senator **Mikulski.** As you know, we want to be able to appropriate the right amount for renewals, which takes me to my next part of that question. In the budget for this year, Mr. Secretary, you asked for $7.7 billion for renewals.

In an August 2, 1989, letter that you sent to the GAO, you said that you needed $8.7 billion for renewals. Would you tell us what happened to the need? That is a $1 billion discrepancy.

[The information follows:]

LETTER FROM JACK KEMP

August 2, 1989

Honorable Barbara Mikulski
Chair, Subcommittee on VA, HUD and
  Independent Agencies
Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Madam Chair:

As you know, the Administration's 1990 budget proposed $667.4 million in budget authority to replace expiring subsidy contracts under the Section 8 program. This letter is to advise you that due to previously unforseen requirements involving contracts expiring in both 1990 and 1991, the minimum amount of budget authority necessary in 1990 to renew these contracts is $1.1 billion.

This adjustment reflects the intent of the Bush Administration to fund all expiring contracts for a term of five years. To accomplish this objective and meet the targets established in the 1990 Budget Resolution (and as adopted by the House in its 1990 Appropriations for VA, HUD and Independent Agencies) the Department recommends an approach which will unconditionally commit the federal government to five-year extensions of 1990 and early 1991 expiring contracts.

Madam Chair, as I explained in my letter to you of May 18, 1989, there are a variety of complex procedures which govern the administration of these subsidy contracts. For example, contracts which expire in the first month or two of a fiscal year must be refunded in the previous fiscal year to allow time for negotiation and execution. In the case of vouchers and the loan management program, one month is the minimum time necessary to move the October expirations into the prior fiscal year. In the case of the Section 8 Certificate program, somewhat more than a month (typically two months) is required.

Because of the previous use of master contracts and the statutory prescription that new leases be written for a minimum of twelve months, renewing contracts under the certificate program presents significant legal, budget and timing difficulties. The Department considered a variety of options to deal with these difficulties, including a worst-case approach that would renew all 1991 certificate contracts a full year prior to their expiration. This approach would have increased the cost of renewing certificates alone to $3.5 billion, with a total cost of $4.2 billion to renew all contracts, including vouchers and loan management units.

After further analysis, we find that it will not be necessary to fund such contracts a full year in advance since there is no legal bar to funding full-year leases out of the existing master contracts, and since they already have sufficient budget authority for such use. Instead, during 1990, we will provide new five-year renewals for those certificate contracts expiring during the first two months of Fiscal Year 1991 (October and November). This will cover approximately 20,305 of the 136,000 units expiring in 1991. The balance of 115,695 certificates, plus those certificates which expire during the first two months of Fiscal Year 1992, will receive funding for new five-year contracts in 1991 (see tables under "C" in the attachment).

In sum, the approach we propose will require $1.092 billion in budget authority in 1990. These funds will provide five-year renewals in 1990 for the 20,305 certificates expiring in the first two months of 1991, and 21,862 vouchers and loan management units expiring during 1990 and the first month of 1991. In addition, as the attached tables indicate, the budget implications of continuing this policy in the outyears remain relatively unchanged from existing budget projections and in no way affect the Administration's commitment to ensure uninterrupted housing assistance to low-income families.

I want to assure you that our commitment remains firm to extend all expiring contracts for a term of five years, and that following the necessary contractual adjustments in 1990, we can commence a more predictable and steady process of renewals in 1991.

The Office of Management and Budget has advised that this proposal is fully consistent with the policy of the Administration on Section 8 contract renewals.

A similar letter has been sent to Senator Garn and to Representatives Traxler and Green.

Very sincerely yours,

Jack Kemp

Attachment

Refunding Expiring Section 8 Contracts in FY 1990

-- The option which we are recommending has the following features:

1. Can be supported without exceeding the $1.1 billion in the Budget Resolution.

2. Will permit reuse of turnover certificates during the final contract year and will permit renewal of contracts without any funding gaps.

3. Will not be administratively burdensome to field office staff, contract administrators or program recipients.

-- The recommended option is as follows:

A. Vouchers and Loan Management

-- All contracts expiring during FY 1990 (after deducting the FY 1990 contracts refunded in FY 1989) will be refunded with new five year contracts during FY 1990.

-- In addition, voucher and loan management contracts set to expire in October, 1990 (first month of FY 1991) will also be refunded in FY 1990.

B. Certificates

-- All FY 1990 expiring certificates have been extended during FY 1989 for at least two years.

-- During FY 1990, we need to deal with the FY 1991 expirations.

-- A total of 701 master contracts with a total of 497,000 certificates have certificates which expire each year beginning in FY 1991.

  * All of these master contracts have expiration dates in FY 1991 (the master contract term extends only to the date upon which the first increment under contract is scheduled to expire) but have sufficient budget authority to be extended out to support those certificates which were obligated in later years.

  * The FY 1991 expirations in these contracts number 136,000 out of the 497,000 certificates under these contracts and the FY 1991 expirations have no additional funding beyond FY 1991.

-- During FY 1990, all 701 expiring master contracts will be extended at least an additional year to FY 1992 in order to handle certificate turnover and lease problems.

-- However, the 136,000 certificates expiring in FY 1991 will not be extended as part of the master contracts.

-- Instead, we will begin in FY 1990 to provide new 5 year contracts for these certificates.

-- During FY 1990, we will provide new five year contracts for certificates expiring during the first two months of FY 1991 (Oct and November).

-- This will result during FY 1990 in new 5 year contracts for 20,305 of the 136,000 expiring FY 1991 certificates.

-- The balance of expiring FY 1991 certificates (115,695) plus the first two months of FY 1992 expirations will be provided new five year contracts in FY 1991.

-- This renewal or replacement with new five year contracts would continue in subsequent years to guarantee continuing subsidy assistance on all remaining subsidy contracts

-- This process will permit an orderly replacement of expiring certificate contracts while continuing to allow for use of all available turnover certificates.

C. Cost of Recommended Option in FY 1990 and FY 1991

Type	Units	Term	Budget Authority
FY 1990 a/			
Certificates (Oct/Nov).	20,305	5	$517,777,500
Vouchers (Oct).........	16,635	5	449,145,000
Loan Mgt (Oct).........	5,227	5	125,055,975
Total..............	42,167	5	1,091,978,475

a/ Includes all unrefunded FY 1990 expirations plus first month of FY 1991.

FY 1991 b/			
Certificates..........	158,088	5	4,232,806,200
Vouchers	41,981	5	1,190,161,350
Loan Mgt	132,647	5	3,332,258,449
Total.............	332,716	5	8,755,225,999
FY 1992 b/			
Certificates..........	138,849	5	$3,903,566,000
Vouchers	69,272	5	2,062,054,000
Loan Mgt	41,980	5	1,107,264,500
Total.............	250,101	5	7,072,884,500
FY 1993 b/			
Certificates..........	113,815	5	$3,359,755,000
Vouchers	51,146	5	1,598,613,000
Loan Mgt	25,057	5	693,948,500
Total.............	190,018	5	5,652,316,500

b/ Includes all remaining expirations during stated fiscal year plus first quarter of following fiscal year. We have not yet recalculated the expirations on a month-by-month basis beyond the end of FY 1991. Recalculation for consistency with the policy for 1990 is not expected to result in significant changes to the estimates.

-- At present, it is not possible to provide revised estimates for FY 1994 since contracts executed during the first two months of FY 1989--which expire in the first two months of FY 1995 are not yet available.

-- However, preliminary estimates indicate a FY 1994 renewal need in the range of $5 billion.

ESTIMATES FOR SECTION 8 RENEWALS

Secretary **Kemp**. Yes; the original estimate that was provided to the committee, I believe, last July, was based on funding to include the first quarter of the following fiscal year; we did not have the data by month, it was not available at that time. We put our projections on the same basis as our revised 1991 request.

So, Mr. Kliman, would you want to explain the difference between the higher original estimate and the ultimate request? But I do want to make it clear that on this issue there is absolutely not an inch of difference between the desire of this committee and the willingness of this administration to put forth the request and spend the money that is needed to fulfill a commitment that I made to you, Madam Chair, over 1 year ago, to 100 percent fully renew expired contracts.

Mr. **Kliman**. Yes, Madam Chair. As the Secretary said, the appropriation that was received last year, based upon the revised estimate that we gave you, included advanced funding of 1 to 1½ months in the year following the expiration of the contracts.

The data that we provided for the out-years last year were not available on a month-by-month basis. So, the information that we provided for 1992 and future years was for a full quarter into the next fiscal year. Since that time, our people have been able to get month-by-month data.

So, the difference of approximately $1 billion represents between 1½ to 2 months of funding into the next fiscal year that is not being requested at this point.

Senator **Mikulski**. Have you talked with the PHA's to see if it is administratively feasible to release their obligations?

Mr. **Kliman**. No, Madam Chair, I have not had any discussions. The program staffs have been working on the details of implementation of this, but I personally have had no discussions on this matter.

Mr. **DelliBovi**. Our field staff have been touch with the PHA's in each of the cities, and there has not been an interruption of benefits, nor has any problem been detected. The PHA's data are as faulty as ours, so we will have to work this out together.

POSSIBILITY OF A BUDGET AMENDMENT

Senator **Mikulski**. Well, Mr. Secretary, and Mr. DelliBovi, last year when we were going through that rather tedious analysis, we all were in a bind because we were high on estimates and short of money.

This situation is similar to an EPA Superfund site. I know that you are trying to simultaneously contain and clean up, and having said that, I want to be sure, Mr. Secretary, that I have your commitment to make no adjustments in your renewal estimates unless the President submits a budget amendment.

Secretary **Kemp**. If I understand your question correctly, you want me to give you an assurance, and I don't know that I will have enough information by——

Senator **Mikulski**. First of all, this is your best estimate now.

Secretary **Kemp**. Right. Right.

Senator **Mikulski**. And I accept that in good faith.

Secretary KEMP. Right.

Senator MIKULSKI. Well, let's say we have what happened last year and we are $1 to $2 billion short. I then am stuck with the bill, and what I am saying is that there will be no adjustments in the renewal estimates unless there is a concomitant request for a budget amendment that would meet these shortages.

Secretary KEMP. I can give you that assurance. I would like at least 24 hours to make sure that I get a chance to speak not only for Kemp, but also for OMB, and I don't imagine that there would be any problem, because the President, as you know, authorized me in last year's hearings to commit this administration to 100 percent funding of expired contracts, and so I will make that my predicate.

But I would like you to give me at least overnight to make sure that I have——

Senator MIKULSKI. And I would like for you to do the same for me. [Laughter.]

Secretary KEMP. Pardon me?

Senator MIKULSKI. This is like a hurricane at Ocean City. I will be happy to give you a day if you could give me a week.

Secretary KEMP. I understand what you are saying, and you have my commitment. All I want you to do is give me the benefit, and—before I start making statements, my pledge to you is to be that type of a Housing Secretary who comes up with the money—I would like to check with OMB. But I don't see any problem in giving you that assurance today.

I am not leaving any wiggle room, other than just to allow me to clear how they would want to come up with a budget amendment, but be assured, Madam Chair, that we share your commitment. We share your pledge to those low-income residents in publicly assisted housing that expired contracts will be fully committed.

PREPAYMENT OF MORTGAGES

Senator MIKULSKI. Well, I appreciate that, but I would like now to get into the 231's and the 236's. These numbers may not mean a lot to people watching this hearing on C-SPAN, but if we don't keep open the preservation of these mortgages, we could end up with a tremendous number of people out in the streets.

Secretary KEMP. I agree.

Senator MIKULSKI. Also, I would like to note that the prepayment moratorium expires September 1990.

Secretary KEMP. Right.

FINDINGS OF REUSS COMMISSION

Senator MIKULSKI. HUD proposes $412 million in the 1991 budget as part of the HOPE proposal to protect tenants who are adversely affected by project repayment. Are you definitely sure that we have accurate numbers? The Hills-Reuss Commission said that there is likely to be 243,000 applicants, and HUD says the number is 154,000. That is one fact.

Last year, HUD said about 365,000 units were eligible to prepay over the next 15 years. HUD says the number was about 334,000. What are the accurate numbers, and what is the difference between your and Hills-Reuss numbers? Also what was estimated last year by HUD, and what is estimated this year by HUD?

Secretary KEMP. Well, first of all, it is very important to establish, Madam Chair, that again in this administration we are proposing to fund an approach to this preservation issue and a prepayment assistance program that would allow low-income residents who would be adversely affected by the mortgage prepayment on insured projects a chance to buy out, with the right of first refusal.

I know that this has received mixed reviews, but I want to say that my hope would be that we could work out a preservation strategy that would offer those low-income tenants a chance to become homeowners as I alluded to in my earlier comments.

No. 1, we want to offer tenant groups a 2-year right of first refusal to purchase and convert their buildings to homeownership by allowing them the monetary value of a 10-year voucher, which would be in most cases around $60,000, and could in tighter markets go up to $80,000.

They then could form tenant management, resident management organizations, or corporations, and with a limited equity position would have right of first refusal over 2 years. The Hills-Reuss Commission study did not take into consideration this 2-year right of first refusal.

No. 2, it would provide incentives to the owners to maintain the property as low income, if the tenants, for one reason or another, decided not to purchase the project.

No. 3, it would protect the tenants should an owner choose to prepay. In spite of the efforts that both of us want to make to protect that low-income community, they would be allowed to get the type of rental and moving assistance that you would expect from this administration's efforts to promote homeownership.

The numbers are based on surveys of owners. That leads into all sorts of subjectivity when owners are presented with scenarios that have been discussed, all the way from this committee to Congressman Kennedy of Massachusetts, and his idea, or the administration's approach, and so that has led to some of the differences in the numbers.

But our estimate is based on the implementation of our policy, and I must admit that different policies might lead to different results. So, Al, do you want to address the issue of where the differences in the numbers might otherwise come from?

Mr. KLIMAN. Well, it is just basically different estimates as you indicated. It represents our latest estimates as I understand it.

Secretary KEMP. And I——

Senator MIKULSKI. Well, there are substantial differences.

Secretary KEMP. And if I could add just one postscript to this. The Hills-Reuss Commission did their study in what year?

Mr. DELLIBOVI. In 1988.

Secretary KEMP. And changes in markets, and changes in regions of the country—I think we are dealing—and I am not trying to dodge the question, because it is a legitimate one, but there are such incredible market forces at work here, and different political solutions being proposed, that owners are not really getting a chance to respond to just one strategy, and I would imagine that has led to the most changes in estimates.

Senator **Mikulski**. But part of the data, and my time is up, I am going to turn to my other committee members, but part of it, excluding the Hills-Reuss one, is more than 3 years old.

Secretary **Kemp**. Yes.

Senator **Mikulski**. That's true, but your own estimates have changed during the course of 1 year by $31,000, and that is a substantial difference, and I think that you might want to go back and review that again more precisely.

Secretary **Kemp**. Madam Chair, we are looking at this constantly. You have, again, my best pledge to you and other members of this committee, and the House committee, to make sure that the ultimate resolution of this prepayment issue, preservation issue, is done with an eye on coming up with a strategy that protects the property rights of both the residents, as well as the owners, who entered into a contract with the Government 20 years ago.

Senator **Mikulski**. Senator Garn.

INCREASED STAFF FOR HUD

Senator **Garn**. Thank you, Madam Chair. Secretary Kemp, in addition to all of the problems that we are well aware of, and the potential criminal and ethical violations that occurred, even if HUD had totally honest people, and those revelations or situations had not happened, it came to me abundantly clearly on all of the hearings that there was a problem in lacking the necessary people for all of the technical analysis and estimating. So, HUD had a problem despite the unethical part of it.

Last year we increased your budget by $35 million for that purpose, and this year you are asking for about $75 million more. My question is simply that with those additional funds, is this adequate to handle the last part of the problem so that you can hire adequate staff to solve that problem?

Secretary **Kemp**. Well, we have asked, Senator Garn, as you point out in your question, for an increase of staff, and we have asked for an increase in our 1991 budget of 725 staff-years above the 1990 current estimate.

I believe that is adequate, and this is an incredibly subjective area, and if it isn't, we would ask for more. I am sensitive, if you will, to building bureaucracies, and asking for more staff, and we have been very tough on all of our program areas to make sure that the men and women who came into HUD as political appointees do the very best job that they can with the existing staff.

There are an awful lot of good career people there, and I think we have done—I am going to say a respectful and admirable job with what we have had in the past, but the increase, I believe, is necessary, and I would appreciate, as I have gotten in the past, the future cooperation of this committee in our request for additional staff-years. Al, do you want to make a comment about this?

Mr. **DelliBovi**. I would just say, Senator, that one of the problems that we face at HUD is people in the private sector are making four and five times the salaries that our employees make. As fast as we train people, we lose people, and that is an ongoing problem that we have.

This situation continues, and I frankly do not know what the solution is. People who have families to raise, are going to sieze other opportunities. It is a very competitive situation and it is a constant drain on the agency.

Senator **Garn**. Well, I understand, and I am not trying to be adversarial. I want to solve the problem.

Secretary **Kemp**. Most of the increase, Senator, is coming in housing. Most of the increase—460 of that 750 is coming to housing, where we focus most of our reforms. Fair housing is going to require more staff-years, and the Office of the Inspector General. I don't want to leave out that we are computerizing the training, and the efficiency level of our employees, is a constant reminder that we can do a better job without trying to empire build.

You just have my pledge to work with this committee, and be as prudent and as business-like as we possibly can.

BUDGET AMENDMENT FOR SECTION 8 RENEWALS

Senator **Garn**. Let me just make another comment on your commitment to come up with a budget amendment for the administration, and I want to emphasize here why her question is so important.

She became the new chairman 1 year ago in January, and faced with being the chair of what I think is the most difficult subcommittee of all, because of having such diverse agencies within the pot and competing against each other, and after she diligently worked to produce a budget under some very tight 302(b)'s that is when we found out about the extras all at once, and we get dumped with it, and her comment was very softly stated, and we were left with a very difficult process of where do we get it.

Do we take it out of NASA, or take it out of Veterans, or do we take it out of a lot of other agencies? We have an even more difficult problem this year, and so I want to emphasize, and I appreciate your commitment, Secretary Kemp, but in trying to define a budget and go through this very difficult and torturous process of trying to fund all of these different agencies, and we don't want to suddenly find out that it is on our back to take all the heat and the difficulties of taking it out of these others.

So, we certainly expect the administration to come up, and again not in an adversarial way, and say that was our best estimate in May, and we are sorry, but we have to request some more, and here are some suggestions of where it can come from, because we simply can't start divvying up that pie all over again at the end of the budget process. So, I appreciate your pledge.

Secretary **Kemp**. Well, thank you. You have my pledge, Jake, to be sensitive to the chair's problems of last year, and make sure that it doesn't happen again.

LEAD-BASED PAINT ABATEMENT

Senator **Garn**. Let me ask you another question that goes on year after year, and that is lead-based paint abatement, and I guess it would not seem like the HUD Subcommittee if we were not discussing lead-based paint, and I realize all of the difficulties, and the costs, and the unresolved technical and scientific issues that go with it, but what is the current status of the Department's efforts on lead-based paint?

Secretary **Kemp**. Well, as you know, the funds for the planning and testing of this lead-based paint problem, and the abatement thereof, are funded in CIAP. The CIAP request is by the way double the 1990 request, and we asked for $1 billion in 1990, and there is considerable money in CIAP's pipeline that my staff, our people, are working to unclog as rapidly as possible, because I share the committee's concern and sense of urgency, both for Community Improvement Assistance Program moneys, as well as this lead-based abatement problem.

The Department has not requested separate funding for the lead-based paint problem, but the funding will be, as I said, provided within our CIAP program. The fiscal year 1992 budget, I would say to the gentleman from Utah, will be the first budget to include the full impact of the lead-based paint guidelines.

Senator **Garn**. Do you feel that you are getting a better handle on the scientific and technical aspects of it?

Secretary **Kemp**. We got the guidelines out on time, and my answer is, yes, but I don't want to put it in concrete, because I just know that these things are incredibly challenging to have any agency as large as ours say with finality that we have that perfect level of equilibrium.

But, yes, given the exigencies of the moment, I think we have a much better handle on it than has ever been had before in the history of HUD. Now, unfortunately, that is not that great of a statement.

Senator **Garn**. Well, the point here is that obviously we all want to solve the problem, but in the past, sometimes in these situations, we would just appropriate money without knowing how it was spent, and so we would waste a lot of money and would not solve the problems.

Secretary **Kemp**. Right.

PRICE-WATERHOUSE STUDY ON FHA

Senator **Garn**. And we certainly found that out with asbestos. So, my question is if we are getting a better handle on the scientific and technical aspects. Just one more question, Mr. Secretary, and I suppose that this comes from more of a question that I had as a member of the Banking Committee than this subcommittee, and that is we are still waiting for the presentations and other data obtained from Price-Waterhouse on the FHA funds, which was due on March 15, and as you know, we have been in a great deal of contact the last few weeks working on a housing authorization bill.

I certainly would think and believe that we must have access to that information before we get to the housing bill on the floor, when we are talking about authorizing that, or some of that, and I think we certainly need to know the nature of the problems, if any, and the costs involved in FHA.

My question simply to you is when do you anticipate that this information is going to be made available?

Secretary **Kemp**. Well, thank you, Jake. Thank you, Senator Garn. I have said in the past that we expect it very soon, and that is my answer today as well. I hope that my credibility is not being eroded. I am as anxious for this study to be completed as is this committee.

We agree with you that it is needed before a housing bill goes to the floor, and you have my—it is in my interests, or our interests, and the administration's interests, as well as the Congress', to have that study done expeditiously, or to get it completed in time.

Seeing that we wanted the housing legislation as badly as the Congress, I can assure you that we are putting pressure on Price-Waterhouse to finish it, and get it to us, and I will be glad to come up and brief the Congress, and look forward to it.

I am going to say 10 days, sir, and definitely before the end of May. It is almost completed and you can be assured that I have no reason not to push on that and get it here as soon as I can.

Senator **Garn**. Thank you, Mr. Secretary.

Senator **Mikulski**. Senator Lautenberg.

COMMITMENT TO INTEGRITY

Senator **Lautenberg**. Thanks, Madam Chair, and welcome Secretary Kemp. Mr. Secretary, one thing that this Senator would not argue with, and I doubt that my colleagues would, is that we are very confident that you have the commitment, the integrity, and the credibility to want to sort things out, and I respect you for that.

We can disagree on the scope and strategy perhaps of things, but no one feels stronger than I do that you are sick and tired of this mess and want to get done with it.

Secretary **Kemp**. Thank you.

Senator **Lautenberg**. All of us feel similarly. When you say that there is no room for politics, in an election year or otherwise, in awarding grants, I take you at your word, and I believe that should be, and hope that it certainly will be the case.

You can't, however, not understand our misgivings about what happened. You know that my State figured very much in the political process, and grants were given—at least according to all kinds of reports, both newspaper and otherwise—that politics was a significant factor in the decisionmaking on the grants that were given to my State.

So, that assurance is necessary, and comforting in a way to say the least.

Secretary **Kemp**. Thank you, Senator.

Senator **Lautenberg**. I hope that we will get on with building the infrastructure to make sure of these judgments. Senator Garn asked, and it is very interesting coming from Jake Garn, whom I know hardly as a big spender, to ask if you had enough money to do the job with.

INCREASE IN STAFFING

Because Jake knows, having been a mayor and having been on the front lines, and having been up in space, that if you don't have enough crew members, it is going to be awful hard to fly that ship, and I would urge you to take a good look at what you need, and don't be embarrassed, because I know that there is a tendency with some of the folks who hang around us to salute smaller government based on some kind of an image that small is beautiful.

I think that small is beautiful, but I think that efficiency and reliability is even more important, and I would not want to be in a spaceship with one hand short. So, Mr. Secretary, I urge you to get out there and get the people in place.

One of the things that I have seen in the Government over the last few years that I think has cost us some very serious problems is the fact that we are understaffed in many areas, whether it is the IRS or other places, we just don't have enough hands in many cases to do the job.

When we talk about a data base, when I think of the scope and the complications of the portfolios that you have, and the properties that you are involved with, and the numbers of people, and the level of government, the lack of a data base is perhaps one of the most serious problems that we have in the managing of our programs. The lack of reliable information, is embarrassing to say the least.

I would urge you, or hope that you would avail yourself of the availability of private contractors, if necessary, to get that data input cleaned up, and get it into the files, so that when you appear before a committee, or appear before the press, or you appear before OMB, that you know that you have all the information that you need and that it is reliably placed.

Secretary KEMP. I appreciate your comments, and don't worry. The people that I hang around with did not influence me on this, and I don't know what you were alluding to, but you can be assured——

Senator LAUTENBERG. Well, just to get it down to size, you know, and you pay a price and there is no free lunch.

Secretary KEMP. I understand that. About one-half of our request is for computers, and the problem was not so much staff, although that was a problem. The problem, Frank, was the incredible lack of technology, and business-like practices, and accounting, and so you have my total commitment.

I do not want to come up here again and go through what I went through last year. We have formed a task force, Frank, to undertake and to be able to answer the Chair, and Senator Garn, and yourself, and this committee, in such a way that we will never ever allow HUD to be put in a position where it didn't even know where those section 8 contracts were. That was a disgrace that has been allowed to exist far too long.

It was just as scandalous as some of the abuses of profiteering and politicking that had taken place. So, I appreciate your comments, and I take it very seriously.

DRUGS IN PUBLIC HOUSING

Senator LAUTENBERG. I want to confirm some ideas that we have not directly exchanged, but when I see your budget request I know that we are right on the same track, in terms of getting rid of the drug problems in public housing.

Secretary KEMP. Yeah. Right.

Senator **Lautenberg**. It is the most destructive force, because people are afraid to go out and take care of their property, and afraid to confront the drug dealers in order to attain a more amenable lifestyle.

I want to ask you a few questions about the law that I wrote a couple of years ago, the Public Housing Drug Elimination Act. I hope we can keep the questions and the answers short.

Secretary **Kemp**. All right.

DRUG ELIMINATION GRANTS

Senator **Lautenberg**. Did any political appointee to your knowledge have any input in the selection process in any way, or was the granting of an application consideration purely merit based?

Secretary **Kemp**. It was merit based, Senator. I acknowledge that there were problems, and I have spoken to the House about them, and I speak to you about them very candidly, and it was $8.9 million, but I can tell you that grant applications were scored on merit entirely by civil servants, and that political appointees did not have any discretion in the selection process.

Senator **Lautenberg**. It has been suggested that antidrug efforts in public housing ought to be funded through the operating subsidy formula rather than through the competitive program established under the PHDEA. Of the two alternatives, which best targets resources where they are needed, and encourages public housing authorities to develop quality antidrug programs?

Secretary **Kemp**. Well, the disbursing of antidrug funds to public housing agencies through a competitive grant program is efficient, and allows us to focus the program on the drug problem, and if funds were totally distributed through operating subsidies, we would not be able to target them, Senator Lautenberg, as well to the areas where there is a drug problem.

Now, I acknowledge the screams and howls, and the gnashing of the teeth that we caused, and I would consider last year's merit grant problem to be more of a problem due to the small size of the program, rather than what we have in 1990, and in 1991 to come, given the cooperation of this committee.

Senator **Lautenberg**. Could you tell me whether the large housing authorities got their share of grants again, and we are talking about almost an anthill here?

Secretary **Kemp**. Right.

Senator **Lautenberg**. But did they get their fair share of grants for——

Secretary **Kemp**. After getting the questions from so many Members of the Congress, and mayors, we analyzed the results, and they showed that nearly three-quarters of all the applications that HUD received were from housing agencies with 1,250 units or below.

However, over one-half of all the applications that were funded came from housing agencies with over 1,250. It was so imperfect as to almost——

Senator **Lautenberg**. But the bigger PHA's were not left out?

Secretary **Kemp**. They were not left out.

PHA INTEREST IN DRUG ELIMINATION GRANTS

Senator **Lautenberg**. What about the response, in capsule form if you can, of housing authorities response to the program?

Secretary **Kemp**. A tremendous disparity; among PHA's you mean?

Senator **Lautenberg**. Yes.

Secretary **Kemp**. Yes; a disparity.

Senator **Lautenberg**. About what? About not liking it?

Secretary **Kemp**. Well, some cooperative, some eager, and some not so eager, and some not so cooperative. They are ranging from zero to 10 on a scale of metaphysical certainty, to noncooperation, and I can tell you that it ranged through the whole gamut.

It is incredible to me, and in fact, I really would like to work with this committee and the Congress in such a way as to get HUD, and PHA's around the country on the same wavelength. I am not now trying to beat on them, but I can tell you that we have had some PHA's literally say that we are not going to cooperate with Bush and Kemp's administration, and others have been totally cooperative.

It has nothing to do with party, it has to do with the sense of bureaucracy, and a sense of empowerment. But I have basically been pleased that there are a lot of people working very closely with the PHA's, and I think that there has been an increase in the level of cooperation. Let me put it that way.

Senator **Lautenberg**. Saved by the bell, Mr. Secretary. Thank you very much.

Secretary **Kemp**. Thank you. Could I just add a little footnote to this? I thought when you started to ask the question that I would want you to know that there are legal—as tough as we want to be on drugs, there is a group of advocates and activists out there who are doing everything that they can to frustrate the efforts that you and I, and other members of this committee had tried to implement to get the user, the doer, and the dealers out of public housing.

For every one that we get out, I can't tell you the lengths to which other bureaucrats will go, including legal services, to get lawyers and frustrate the very goal that both you and I share. It is an incredible——

Senator **Lautenberg**. I bet on you, and I know that you weren't a fullback, but you could always participate in the strategy and rely on it.

Secretary **Kemp**. Thank you.

Senator **Mikulski**. Senator D'Amato.

Senator **D'Amato**. Thank you, Madam Chair. Mr. Secretary, I certainly join with my colleagues in wishing you success in some of the undertakings that you have discussed today, and particularly I think that it is important that the $98 million, as it relates to the drug elimination efforts in the public housing authorities, be awarded with careful administrative care and monitoring, so that we can see to it that those funds are not only made available, but that their utilization is something that is going to be tangible.

MONITORING OF FUNDS

Because I happen to share with you that although we recognize the initial efforts of not having nearly enough funds, if we don't set standards of criteria by monitoring the utilization of these funds, it is just going to be pouring more money into this pot, and we are going to be misleading people and the public, and I would hope, and I am going to ask what efforts do you have underway as it relates to monitoring the utilization of those funds, so that we are just not putting more money into the housing projects, and not getting the kind of protection, or the kind of work that the people desperately want.

Secretary **Kemp**. We have requested in this budget, Senator D'Amato, $25 million for a carefully targeted and specifically designed ongoing monitoring of HUD's programs.

Plus, in answer to your question, I want to tell Frank Lautenberg of New Jersey, in answer to a previous question, we have pledged in the first reform of the—we call it reform one, passed and signed into law last November or December, that we will publish every decision that we made, and the criteria surrounding that decision in the Federal Register, so that you can be assured, and the public can be assured, that there is no one playing games at HUD with those types of political decisions that all too often in the past were being made.

So, I think that the combination of monitoring, Al, $25 million in monitoring coupled with publishing all of our decisions and criteria surrounding that decision, will begin, and not be the end, but begin the process of getting closer to the goal that you and I both share.

Senator D'**Amato**. Because, again, obviously the need is there.

Secretary **Kemp**. Right.

Senator D'**Amato**. It is $98 million this year, and $150 million for fiscal year 1991, but I think that members of this committee want to be assured that the public housing authorities themselves are utilizing these funds specifically in this area, and that it just does not become another pipeline but gets them funds that are channeled for this specific area, to take on those drug problems.

Because I have to tell you, whether it is in Newark, or whether it is in New York City, or whether it is in Baltimore, a life for people in these projects has absolutely been debilitated as a result of this—it is criminal, the criminalities that take place.

I remember the projects in Newark years ago when I was a youngster, and they weren't that way, and I would say that the projects in most of our communities were not that way, and the single, greatest contributing factor to the decline of the quality of life I think is the drug epidemics.

So I would hope that there would be specific monitoring, I hope, and that there be specific emphasis in this area, and I think it would pay great dividends.

Secretary **Kemp**. Right.

Senator D'**Amato**. And if—do you intend to write it that if the housing authority is not using these funds in this area specifically, and really targeting these dollars for that drug program, you hold them up? You don't give them one award, do you? You may not know.

PROCESS FOR DRUG ELIMINATION GRANTS

Senator **Lautenberg**. If the Senator would yield 1 second. The application process calls for very specific plans by the PHA's, including involving the residents and they have to be very specific.

Senator **D'Amato**. Well, again, I just would like to make the point that I think it is absolutely essential that there be this careful monitoring, and that if they are not doing what they say they were going to do, that the funds be stopped.

Secretary **Kemp**. We do have that authority.

Senator **D'Amato**. You do have that authority?

Secretary **Kemp**. Right.

Senator **D'Amato**. Good. Good.

Secretary **Kemp**. We will use it. I don't want to be in the position to just be sweeping the judgment of the PHA's, but I do want them to know, and I appreciate the question, that we do have the authority to withhold funds. I sent to the Congress, and hope that members of the committee will read, our report to you which reviews the funding requirements for our drug-free housing initiative developed by Julie Fagan, who is my Director of this office at HUD for drug-free neighborhoods.

She came, incidentally, from Gov. Roy Ramos' program in Colorado, and she has been an outstanding public servant in helping us develop our initiatives for drug-free neighborhoods, and drug-free public housing.

So, that should be on your desk, sir, or in the record, but I appreciate the question.

[The information follows:]

Report to Congress
Review of Funding Requirements
Drug-Free Housing Initiative
Department of Housing and Urban Development

In the past, the Department of Housing and Urban Development's (HUD) role has been to provide housing for low-income Americans, with little emphasis on quality of life issues. As a result of Secretary Jack Kemp's priority initiative for drug-free public housing, HUD has expanded its focus to include empowering housing officials and residents to develop and implement management improvements, drug enforcement, and prevention programs.

Because of this change in direction, regional staff, housing authorities, and residents are in need of information, skills and funds in order to carry out initiatives to rid their developments of drugs. To address this need, HUD provides appropriate support services which include: grants, technical assistance, training, an information clearinghouse and evaluations.

President Bush and Secretary Kemp have proposed an anti-drug program budget of $150 million for fiscal year (FY) 1991. Of the $150 million, $144,126,000 will be dispersed in grants; $4,200,000 will provide technical assistance; $1,172,000 will implement training; and $300,000 will provide information and materials through the Drug Information and Strategy Clearinghouse. HUD also proposes to transfer $202,000 to the Office of Policy Development and Research for evaluations of various HUD programs.

Public Housing Drug Elimination Act Programs

The Public Housing Drug Elimination Act of 1988 set forth several programs to be implemented by HUD. These are the Public Housing Drug Elimination Grant Program, a regional training program (HUD has added a technical assistance component to this), and the Drug Information and Strategy Clearinghouse.

Grants:

In FY 1991, $144,126,000 in funds will be distributed to PHAs (under current law the only eligible HUD grant recipients) through a competitive grant process. In order to make the grant program more inclusive, HUD has proposed legislation to make owners of HUD-assisted multi-family housing eligible to receive drug elimination grants. HUD has also forwarded proposed legislative changes which would allow resident management corporations to apply for drug elimination grants. As stipulated in the Public Housing Drug Elimination Act of 1988, funds may be used for:

- employment of security personnel and investigators;
- reimbursement of local law enforcement agencies for the cost of providing additional security and protective services;
- physical improvements to enhance security;
- support of tenant patrols cooperating with local law enforcement agencies;
- innovative programs to reduce drugs in and around projects; and

- funding of resident management corporations, resident councils or other organized groups of residents who will share in the managing and/or operations of the program.

Technical Assistance:

The technical assistance program represents HUD's commitment to support the individual efforts of housing authorities and residents in their strides to improve operations and drug program strategies. It also recognizes that the best experts on these issues are often housing authorities and residents themselves. This program will draw from a pool of "peer consultants" and professionals to respond on a short- and long-term basis. For FY 1991, HUD has budgeted $4,200,000 for technical assistance, allotting for 200 short-term and 120 long-term technical assistance requests.

HUD technical assistance will provide a peer consultant (for example, a PHA or resident representative) or professional consultant to serve as an advisor to the requesting PHA to assess drug programs and operations; implement practices and programs; and improve overall agency management, operations and programming to address the drug issue. Applications for assistance will be reviewed and awarded based on meeting a list of criteria, which will include demonstrated need and the severity of the local drug problem.

Training:

HUD's new anti-drug initiative focuses on empowering housing officials and residents to develop and implement management improvements, drug enforcement, and prevention/intervention programs. Because this is a new direction for HUD, there is a significant lack of knowledge and skills which must be acquired by HUD staff, as well as PHA officials, resident groups, and others participating in the drug enforcement and prevention efforts sponsored or supported by HUD.

In order to effectively carry out the Secretary's initiative for drug-free public and assisted housing, HUD staff, PHAs officials and residents need training to develop a variety of skills such as, community organizing, conflict resolution, partnership building, and anti-drug strategy planning and implementation. For FY 1991, HUD has budgeted $1,172,000 to implement the following training programs:

Clean Sweep Training

Developed by Chicago Housing Authority Executive Director Vincent Lane, "Operation Clean Sweep" is a nationally acclaimed method to secure troubled high-rise buildings from drug dealers, gangs and other criminals. Under this training program, a team of experts which have successfully conducted a "sweep" will work with local officials to assess the situation. After the site assessment is complete, teams will be trained and will conduct a "practice sweep." This will be followed by technical assistance.

"Operation Jumpstart"

"Operation Jumpstart" will provide crisis intervention to developments in emergency situations. Response teams will be selected from each region to consist of appropriate HUD regional staff, housing authority officials, residents and law enforcement experts. Teams will then attend specialized a training session at a centralized location. Experts from around the country will provide training, focusing on gaining control of the crisis situation, mediating differences and facilitating leadership to action.

Core Comprehensive Training

Local planning teams, which include PHA staff, residents, and community leaders, will receive training in planning skills and in the development of management, enforcement and prevention strategies.

At least two training sessions will occur per year. Programs will consist of anti-drug strategy information, skills training and strategy planning.

Regional Training

Specialized training will be available on a regional basis and will include:

- General Skills Training -- Training will provide PHAs, resident groups and community leaders with skills training in communicating, managing conflict, community organizing, conducting effective meetings, and building partnerships. This will help enable all sectors of the community to come together in a collaborative effort to develop comprehensive plans for drug enforcement and prevention, resident management, economic development, and homeownership.
- Management Techniques -- Training will provide instruction on effective management techniques, including: effective screening procedures, streamlining the eviction process, exploring various security options, methods to reduce vacancies, developing a Drug-Free Workplace plan, as well as organizing and working with resident groups.
- Enforcement Strategies -- Areas of focus for training will include developing and implementing enforcement strategies for drug elimination, such as: sweep operations, tenant patrols, drug tip hotlines, seizure of property and leasehold interest in units, and community policing.
- Prevention/Intervention Programs -- Training will begin with information on the various theories behind prevention programs and how they translate into effective programs. Training in prevention program development will include areas such as: parenting skills, family management, youth initiatives, resident/student assistance programs, and referral programs.

Training of Trainers

To increase the local capacity to conduct regional drug training programs, "training of trainers" sessions will be conducted. Trainers will be instructed on training design and supplied with appropriate materials, to include: overhead transparencies; exercises; handouts; and, lesson plans. Two sessions will be held to train approximately 90 trainers.

Teleconferences/Videos

Teleconferences and videos will be utilized to explain new and existing regulations, rules and policies. These mechanisms will publicize management tools and highlight effective programs.

Teleconferences, utilizing new interactive television technology, will facilitate "summit" discussions and keynote speaker presentations. This will increase the capacity for large audience participation.

Clearinghouse:

The Drug Information and Strategy Clearinghouse (DISC) gathers information on public housing management, drug enforcement and prevention programs. Information requests can be made through an "800" access telephone number or by mail. For FY 1991, HUD has budgeted $300,000 to operate DISC.

DISC has developed databases and information packages on various effective anti-drug programs, describing the programs and listing contact people. Other materials include: training materials; information and funding sources; and, bilingual information. DISC also coordinates with other appropriate clearinghouses to access their information and products. In the future, DISC will collect new or amended statutes, legal decisions, regulations, policies and procedures on drug issues and programs. This includes copies of model drug policies, lease agreements and other documents.

DISC tracks types of requests, identifies trends, and develops appropriate materials for dissemination. Additionally, DISC identifies, evaluates and recognizes outstanding model programs. Promotional and informational brochures have been developed, along with a quarterly newsletter and topical information packages.

Comprehensive Improvement Assistance Program (CIAP)

In FY 1989 HUD gave PHAs requesting funds under CIAP for anti-drug efforts preference in funding consideration. Eligible anti-drug activities include:

Physical Improvements -- Under special purpose, emergency, and comprehensive modernization, eligible physical improvements related to eliminating drugs include:

- installation of security hardware and additional lighting;
- redesign of entrances to create defensible space;
- installation of fencing around the perimeter of the project; and
- conversion of a dwelling unit into non-dwelling space for use by project management or tenant patrols for security services.

Under emergency modernization, a determination as to the eligibility of the physical improvement (i.e., correction of an imminent threat to tenant life, health and safety) must be made on an individual work-item basis.

Management Improvements -- In addition to the physical improvements, PHAs can use some of the additional funding for management improvements. Some examples of management improvements include:

- coordinating the provision of appropriate social services; (i.e., drug education and treatment referral programs.)

- hiring security guards during the implementation of physical improvements or longer, but not to exceed five years;
- developing more timely management techniques for dealing with disruptive tenants and drug-related crime;
- developing and implementing improved screening procedures for prospective tenants.

Data Tracking System:

The Field Office Data Entry for Modernization Approvals Data System (FODEMADS) provides select information about modernization funds used for drug elimination activities in public housing efforts. As structured, the data is scheduled to be available by mid-December of 1990, for FY 1989 CIAP funding actions. The system provides figures for amounts used for drug elimination by PHA or by HUD field office. These figures will be broken down into "hard costs" and "soft costs." "Hard costs" will include such things as security equipment and hardware purchases for drug efforts and "soft costs" may include costs such as hiring a drug coordinator or security guards.

Community Planning and Development (CPD) Programs

Community Development Block Grants (CDBG) are often used for drug elimination efforts. However, it is impossible for HUD to target these funds for anti-drug programs because spending priorities are set by state or local governments. CDBG communities are encouraged to use CDBG funds for anti-drug efforts, and a Notice has been published by HUD which outlines the eligible anti-drug uses of CDBG funds.

Due to the local and state control of allocated program money, it is difficult for HUD to specifically track and pinpoint what financial support is being directed toward drug activities. The Department will pursue monitoring and reporting options to increase tracking of drug related activities.

Evaluation

The Office of Policy Development and Research (PD&R) plans to undertake an assessment of a variety of program models for combatting drugs in public housing in an evaluation of drug elimination activities being undertaken by public housing agencies. PD&R also plans to develop and publish a casebook of effective and comprehensive anti-drug strategies to assist housing officials and residents in their efforts to eliminate drug activity in their communities.

SECTION 202

Senator D'Amato. I have only one other question, and I have a number of questions, Madam Chair, that I would like to submit for the record.

Senator Mikulski. All right.

Senator D'Amato. I know that the administration proposes to reduce funding for the 202 Elderly and Handicapped Program from 8,500 units, that is $480 million, to $290 million, and that would mean from 8,500 units to 3,900 units.

I make note of this, Mr. Secretary, and I am not going to ask you for a response, but I make note of this in light of the fact that there have been a number of my colleagues who have hesitated in supporting the idea for block granting this 202 program on the theory that it would lead to a diminution of the 202 housing.

I think that they should open up their eyes. Last year, it was 11,000 units, and this year it is 8,500 units, and next year we are proposing 3,900 units.

So, to those that have indicated that they are afraid by eliminating the categorical program of 202, I would suggest that not only do we have a pipeline which contains 26,000 plus 202 housing units, and that is billions of dollars that have not gotten through, and I certainly applaud your increased efforts to unclog that line, but that their argument that by block granting it will diminish the ability to sustain this program flies in the face of exactly what is taking place.

So, I don't mean to be arguing this point with you, and I don't raise a judgment question, but I just simply submit for the record that what is taking place is exactly what people have feared.

It just seems to me, Mr. Secretary, and I will reiterate it again, that if we did block grant the program, the money gets to all of them, and we don't have these cost containment battles to enrich the program, and if that means putting on a larger room for the seniors, because that generally is where this program breaks down, with the amenities. Most local public housing authorities don't want to have just a box with a bunch of rooms in there, and then not giving the senior citizens the dining hall, without the amenities necessary to make it something where they might have a quality of life.

You would be surprised that public group after public group will come to us and say, look, they are holding this up, and so I just make that observation.

Secretary Kemp. Could I just make a quick response, and not to argue, but just to clarify my position. I know, Senator, that you care about 202, and I applaud the Congress on both sides of the aisle for their patience with the HUD Secretary in his efforts to unclog that 202 pipeline.

I can tell you that we have made progress, but you need to know that the total number of units for 1991, including leased units, is 6,967. I pledge to you and to other critics of that pipeline to work expeditiously to not only unclog it, but to continue to support this modest, yet important, senior housing construction program.

But I wish you would give me some authority to lease units, because we think that we can make an impact on those men and women who need faster access to senior housing, but I applaud the efforts of those in this committee to continue this program, be it block grant, or categorical.

I support the categorical, because I, like you, recognize the importance, and I don't know that just block granting it will do what you and I both want to be done, but I know that the jury is out.

Senator D'AMATO. Thank you, Secretary.

Secretary KEMP. Thank you.

Senator MIKULSKI. Without objection, the Senator's other questions will be admitted for the record.

Senator D'AMATO. Thank you, Madam Chair.

Senator MIKULSKI. The Senator from Georgia, Senator Fowler.

Senator FOWLER. Mr. Secretary, I am glad to see you again, and up front, let me thank you for spending so much personal time in my city of Atlanta to look at the problems of public housing firsthand, and everyone appreciates all the extra efforts that you are doing around the country.

CONGREGATE HOUSING

I apologize for being late, and you have talked about, or I heard your testimony, but have you discussed congregate housing.

Secretary KEMP. We did.

Senator FOWLER. Well, let me cover it quickly then, and I won't bore you all, and send you all my old tapes.

Secretary KEMP. Well, we call it elderly independence, and whether—and I share the concept of congregate.

Senator FOWLER. Well, I was pleased to see in your HOPE proposal, that you have emphasized the coordination between services in the House through the Budget Committee, and I had several hearings around the State trying to figure out ways to coordinate to prevent what we all want, and that is the unnecessary institutionalization of older people.

But I need to ask you, because I was a little puzzled, why are you apparently proposing to eliminate the Department's congregate housing program and substitute it with a voucher initiative is my understanding, especially at a time when you have asked in the budget for deep cuts in the section 202 program?

Also, I think we are all for a finding of more cost-effective ways of matching housing and services, but this just looks like we are jumping from a proven program to one that is not proven. We have a proven model of service delivery and to one that is unknown and unexplored.

Secretary KEMP. Well, OK, that is a fair question, and I appreciate your interest in this. The President's proposal under HOPE for elderly independence builds on a concept of a congregate housing service program, and it is funded at a level probably 10 times greater than the congregate services program.

So, the frail elderly concept of helping provide services, tied to housing, is a concept that I buy into, and we have the same goal, it exceeds the congregate services program.

Senator FOWLER. I was asking my staff something they don't know, and so let me leave that for a second.

Secretary KEMP. I was just handed a note that my staff says that we are not only asking for the funding of the vouchers, but we are asking for the funding of the service involvement, which we are trying to tie together to this and to our homeless programs, and I can assure you that it is also to tie the shelter with the type of social services that, heretofore, has all been lacking.

Senator FOWLER. Can we have the details, the explicit details of the voucher initiative programs?

Secretary KEMP. I will be glad to supply those to you.

Senator FOWLER. I would like very much to look at them, but it is designed as a—whether we are reorganizing the Federal contents or not, is it designed and presented as a substitute for the congregate housing?

Secretary KEMP. It builds on the idea, let me say that. I would be glad to submit the actual details.

VOUCHER INITIATIVE FOR FRAIL ELDERLY

Under HOPE for Elderly Independence, Public Housing Agencies (PHAs) would receive funds both for congregate services and for housing (through housing vouchers) and for eligible low-income frail elderly individuals. The vouchers would enable the elderly recipients to determine whether he/she wanted to move to receive the housing or services or remain in place. The program would provide incremental housing assistance; it is not designed to serve those already receiving housing assistance, but those perhaps in need of services. The purpose of the program is to test whether services can be delivered efficiently when the elderly continue to live in the general community. The program would be targeted to those elderly who need assistance with at least three activities of daily living, such as bathing or meal preparation. Services would be tailored to the individual's need through the use of a Professional Assessment Committee, composed of volunteer health professionals. HUD would pay 40 percent of the cost of the services, with 50 percent of the cost coming from other Federal, State, or local sources, and 10 percent coming from tenant copayments. Funds would be awarded through a national competition.

HOUSING PROBLEM IN ALMA, GA

Senator FOWLER. Now, to be parochial for a minute while I have the four of you here, I have written you a couple of times on the congregate housing problem in Alma, GA. I won't bore the rest of the committee with it, but I have the details and the letter, and it is one that ought to be resolved, and I am not just being a hometown——

Secretary KEMP. Give it to me today.

Senator FOWLER. But it seems like to impartial observers there that the cause is right and just, and we need a resolution of it, and I would appreciate the Secretary looking at the letter.

SECTION 202

The last question, Mr. Secretary, I have is back to 202 for a minute. Apparently you have some new plans that would involve regional competition for 202 programs, and us folks in little old Georgia are very worried about having to compete with what is available in Florida.

Above and beyond that, leaving the State problem aside, I am also quite frankly worried that the proposals are skewed too much toward the urban areas, and that we have serious problems in the smaller communities and rural areas.

Secretary KEMP. I hear that.

Senator **Fowler**. I have been pounding on the Georgia Residential Finance Authority to get them to build in the rural communities.

Secretary **Kemp**. Right.

Senator **Fowler**. I hope that we are not heading toward a situation where the smaller 202 facilities that could benefit from these areas standing almost no chance of being approved. Are these concerns valid?

REGIONAL COMPETITION FOR FUNDS

Senator **Mikulski**. In addition, if I might add, the Senator from Georgia has raised not only an issue about rural services, but this issue of regional competition is something that is troubling to the Chair. So, we would like to hear about this regional competition—could we have new regional competition that the Senator asked you about?

Secretary **Kemp**. Well, the fair share formula, Madam Chair, I believe would answer the problem of so-called regional competition.

Senator **Fowler**. Well, I get this from the people on the—from the housing people in Georgia, that tell me that under whatever fair share plan it is, that they feel like that they are having to compete with Florida.

Secretary **Kemp**. Well, let me just say to you that in the brief time that I have been there that requests for 202 funding have been far greater in metro areas than in the nonmetro areas. I want to be sensitive to those rural areas in which there is not only a demand, but a demonstrable need as you point out.

In fact, everything that we have tried to do, from your CDBG to enterprise zones, to housing grants, are predicated on roughly one-third or maybe at marginal, but less, going to nonurban metropolitan areas. I can tell you that we do not have as high a demand for the nonmetro areas as we have for the metro areas.

Senator **Fowler**. Well, my time is about up, and I appreciate that, and I understand it, but let me put it where it will do the most good. You spent the time in Atlanta, and you were in Waycross, GA, down near the Okinoka Swamp, or Albany, GA, and they would have, as you know, a very different housing problem.

Secretary **Kemp**. Yes.

Senator **Fowler**. What we need to know is what plans do you have in leaving the primary role of housing to the farmers holding those grants in the small communities in Atlanta, or whether or not—and whatever you want to call it, we can assure the small communities that there is at least a percentage denominated for cities under 50,000, or under 100,000, or whatever it is. Does anybody know the answer to that?

Secretary **Kemp**. You raise a very important issue, and I will be honest and state that I want to spend some time on this and come back to you with an answer to this, and I have no desire to shove out from the competitive process nonmetro areas.

I pledge to you to come back and give you an answer to that, but generally 25 percent at least was to go to nonmetro areas, and I have been sensitive to the questions that you have raised in almost every other program area of the President's HOPE package, but I will be specifically addressing 202 when I get back to you.

[The information follows:]

Percentage of Funds Designated for Nonmetropolitan Areas

The decision to implement a regionwide competition for Section 202 funding was prescribed by circumstances.

Approximately 5,600 units are available for the elderly in 1990 and between 20 and 25 percent of the available funding is to be directed to nonmetropolitan areas. There are 437 nonmetropolitan units in the Atlanta Region alone. In addition, there is a Congressional directive to develop projects of sufficient size to support services far the frail elderly. If the fair share formula were applied unequivocally, some States would receive so few units as to preclude the development of feasible projects.

Therefore, the Department decided that a regional competition would be a reasonable alternative. Nonmetropolitan proposals will be competing against each other and the best will receive funding. The same type of competition will be held for metropolitan proposals.

In total, nonmetropolitan areas will still receive 20 to 25 percent of the total funding allocated for the program but not every State may receive funding this year.

Senator **Fowler**. I appreciate that. On that question it does not have to be that quick. It is just a big one as you know.

Secretary **Kemp**. I hear you.

Senator **Fowler**. Every farmer's home, and they have some houses sitting out there vacant in the rural areas, and they won't rehab it, and they won't lease it, and you can't get any people in there.

But just like we are coordinating services in housing, this is an area where it is sort of like I have to go back over this jurisdictional fight between the SCC and the CFPC on who is going to regulate the market.

This has too long, I think, been resolved by—well, they do that and they do nothing to them, and so I hope that I have the Secretary's attention to the problems of rural and small community housing which is very, very important.

Secretary **Kemp**. I do.

Senator **Mikulski**. Does the Senator from Georgia have any other questions for the record that he would like to submit?

Senator **Fowler**. Well, I think I have done enough loading up for today.

Senator **Mikulski**. Senator Lautenberg.

FUNDS FOR PUBLIC HOUSING DRUG ELIMINATION GRANTS

Senator **Lautenberg**. I appreciate the opportunity, Madam Chair, and I would just request of the Secretary a confirmation as to whether or not a $150 million request for the Public Housing Drug Elimination Act is something that they are actively going to support?

Secretary **Kemp**. Absolutely.

NEWARK ARTS CENTER

Senator **Lautenberg**. Second, we have something that you may not have heard of, Mr. Secretary, and that is called the Newark Arts Center, and the conference committee——

Secretary **Kemp**. Tremendous idea, Senator. [Laughter.]

Senator **LAUTENBERG**. I look forward to attending one of those ballets and——

Senator **LAUTENBERG**. Wait, wait, Mr. Secretary, the city has undergone a renaissance and you would be impressed with it.

Secretary **KEMP**. I am not making light of it, particularly since you brought the mayor down.

Senator **LAUTENBERG**. Well, the mayor is running today unopposed, and he has a good chance of winning. [Laughing.]

Secretary **KEMP**. With all of that good publicity in the New York Times or whatever that I read about.

Senator **LAUTENBERG** [continuing]. If the supplemental that is now under consideration codifies the grant included in the report on the fiscal year 1990 HUD appropriations bill, and the Newark Art Center is included, can you assure me that the funding will be made available from it?

Secretary **KEMP**. As I understand it, it is in the bill.

Senator **LAUTENBERG**. Yes.

Secretary **KEMP**. And I follow the law, and I am a dutiful public servant. Your creditable ability to get that art center into the——

Senator **LAUTENBERG**. Jack, you lost it in the ski range. [Laughter.]

PROBLEMS IN PUBLIC HOUSING AUTHORITIES

The other thing is that the State of New Jersey had terrible, terrible problems in one of its housing authorities, and the Secretary has put together a task force to examine other housing authorities in the State of New Jersey. Do you have any reason to believe that there is a unique problem among New Jersey housing authorities, or is that an aberration, or is there some——

Secretary **KEMP**. I hope that it is an aberration, because of the New Jersey problem, Senator, we have formed that strike force, not only to go into troubled New Jersey, but in other States as well. We have a national task force that review several PHA's outside of New Jersey, and I would like to maintain some confidentiality on where we are operating that strike force at the moment.

Senator **LAUTENBERG**. But you are in other places?

Secretary **KEMP**. Yes; in eight other States.

Senator **LAUTENBERG**. Thank you very much.

Senator **MIKULSKI**. Senator Nickles.

Senator **NICKLES**. Madam Chair, thank you very much. Secretary Kemp, welcome, and I want to thank you for your personal attention in visiting a couple of the housing units and facilities that we have in Oklahoma, and I will tell you that I think your trip was very useful, and very helpful.

Let me ask you, Mr. Secretary, and to our Chair of the committee, and to let you know, Secretary Kemp, that these are the same units that we had the hearing on in March, and the hearings somewhat exposed the fact that these units were dilapidated, and they were drug infested, and they had deteriorated far too much.

Secretary **KEMP**. Right.

Mr. **NICKLES**. The Federal Government was spending a lot of money to improve them until HUD stopped them, and I compliment you for stopping it, and I urged that to happen, and so I am glad that you did. The Federal taxpayers were wasting or rather HUD was wasting $1½ million a year on those units.

CONDITION OF HOUSING COMPLEXES NATIONWIDE

Mr. Secretary, my question is, are we doing that, and are we reviewing nationwide these situations, because I have a feeling that those couple of complexes in Tulsa, OK, were not the only ones. As a matter of fact, I guess they are having problems in Maryland, and problems all across the country, where we have dilapidated units that in all likelihood, and I am afraid, that in many cases the owners are receiving payments far in excess of what they should be in relationship to what those units are actually worth.

Secretary **Kemp**. Well, let me applaud you, and applaud the committee for holding those hearings, and tell you personally, Senator Nickles, that my trip to Tulsa to visit with the residents of Vernon Manor and Morning Star Village, was one of the most inspirational visits that I have had, among many inspiring moments, and I applaud your efforts and want you to know that we want to reform this entire business with HUD.

It first came to my attention in my trip to Tyler House here in the District of Columbia, and in my trip to Tulsa, that we are developing an early warning system to identify these problems throughout the country, and to improve accountability by the HUD staff in the field and in headquarters.

We have taken strong action as you pointed out, and that you called for, and that this committee has encouraged, and I just want you to know that I will never forget that our clients are those women and families, and children, living in those assisted housing communities throughout this country. I will take any action that I legally can to remove this profiteering, hypocritical treatment of lower income people.

I am going to hesitate to say much more, because we are going after—it is under litigation—but you have my pledge, as well as this committee, to make sure that if I do nothing else at HUD, I am going to raise the standards of fitness and affordability, and decency within, and for those people of low income who deserve to live in a much better environment than they have been forced to live in by that program.

Senator **Nickles**. I appreciate that, and so if nationwide there is mention of this early warning system, that HUD is reviewing the complexes all across the country?

Secretary **Kemp**. Absolutely. Yes.

Senator **Nickles**. We are trying to make sure that we discontinue making payments to owners if those units are in despicable condition?

Secretary **Kemp**. Absolutely. We are taking steps to improve multifamily housing management all over the country and we have banned from doing any business with HUD, those who have used these programs for outlandish profit making, and as I said, this is a personal, as well as a political commitment that I make to you on behalf of the Bush administration.

INSPECTOR GENERAL'S INVESTIGATION OF BREWSTER AND AFFILIATES

Senator NICKLES. Secretary, I appreciate that. I believe that Frank Keating, your general counsel, testified on behalf of HUD before a House Banking Committee last month, and I believe he testified that there is an ongoing inspector general investigation into the business transactions of Brewster & Affiliates.

Can you tell us what the status of that investigation is, Mr. Secretary?

Secretary KEMP. It is ongoing. I think that Mr. Keating probably, as my General Counsel, phrased it in words that were both correct legally, as well as politically, and while I am aware of that testimony, I am not aware of the exact words, but I can tell you that it is ongoing, and we are going to follow it to a successful conclusion, let me pledge to you that, Senator.

Senator NICKLES. Are we looking at that in the next year, or do you have any idea, or are you looking at 6 months, or 1 year, or 2 years?

Secretary KEMP. The timing, Don, is I am told, up to the inspector general's investigation reports. So, I would like to leave it at that, and not be held to a date certain. I share your interests in expediting it though, I can tell you that.

Senator NICKLES. Are those individuals—I know that they have been barred from further activity, I believe, in the Washington, DC, area, and also I believe in Oklahoma, but I understand that they have thousands of units all across the country that still continue to receive very large payments for.

Secretary KEMP. On January 26, 1990, HRM, Housing Research Management, and 51 affiliated companies and individuals, including them, Senator, were suspended from any future participation in Government programs pending our full and complete investigation of those alleged irregularities, such as the misuse of project funds. The suspension could last up to 1 year, and it might be followed by further HUD actions, such as debarment and other penalties, and at that point I need to reserve the rest of my comments and feelings for the specific allegations because it is in litigation.

Senator MIKULSKI. Senator Nickles, that bell is for a vote. Continue your line of questioning, and I am going to go vote, and then I will return as soon as possible. Please proceed.

Senator NICKLES. That suspension, does that bar any new contracts, or it doesn't break any existing contracts, and so in other words, they could be receiving payments for 40,000 units across the country?

Secretary KEMP. It does not break an existing contract, but it prohibits any new contract.

Senator NICKLES. Could I ask you, Mr. Secretary, and I think that this would be consistent with the inspector general's investigation, that you review the other contracts that are current and investigate those and see if they are similar, in fact, to the ones that we found in Tulsa. Maybe they already are doing that.

Secretary KEMP. That is ongoing. We are doing that, and I appreciate the suggestion.

Senator NICKLES. You are doing that, because I could see you barring a few new complexes, but if you continue having to pay monthly subsidy amounts for 40,000 or 50,000 units across the country, you could still have a real hemorrhage of dollars, and you could still have very poor treatment for tenants, and you don't want that, and I don't want that.

Secretary KEMP. No; that is correct.

Senator NICKLES. And the taxpayers certainly don't want it.

Secretary KEMP. That is going on and I think we have sent a very strong message to these people as to how seriously we take their failure to perform on behalf of the residents and their responsibilities.

So, you can bet that we have their attention so much so that, they went out and hired public relation firms and are engaged in a massive PR campaign to defend their practices, which are indefensible as far as this Secretary is concerned, and I say that personally. It is indefensible. We got their attention.

Senator NICKLES. Mr. Secretary, I know we have their attention, but I think that we can cut off the subsidies if those subsidies are not warranted, and I think that would be a good step, and I would encourage that. I know that you have done it in a few cases, and if there are other cases that would warrant it, I would hope that would be done as well.

IMPLEMENTING SWEAT EQUITY

On another issue, we have found, and I have encouraged, and I know that you are desirous for it to happen, and that is for tenants to be able to work on improving these units that they live in, so that they can learn and have a little bit of sweat equity.

In that way the tenants can help fix the roofs, and do the painting, and do the remodeling, and we find that the present law, Davis-Bacon, is a real constraint.

We found that in the Tulsa units, and we find that in many cases. Would you be supportive of an effort for an exemption for tenants to be working on their own units or complexes from Davis-Bacon?

Secretary KEMP. Yes; I would like to suggest that where we have been able to work out a relationship with the building trades unions, that there has been cooperation. I am convinced that if I continue to give evidence of my good faith in attempting to work with them, that we can work out some modus avena between the current law, or even a change that would allow as you put it tenants to not only use some of their own sweat equity, but give their children some training of an apprentice-like program that I think the building trades unions would be supportive of.

So, I would like to work upon this issue, and it is widely popular among the residents themselves as you pointed out, and I don't think that there has ever been as massive or as dramatic an effort to give tenants and residents, and their children, and some of the unemployed male and female population in public housing a chance to put in some sweat equity, and this time lead to a real payoff in terms of not only management, but ownership.

We saw that at Vernon Manor in Tulsa, and I was so encouraged by my trip to Morning Star and Vernon Manor.

Senator Nickles. I might tell you that I asked that same question to the head of the NAACP, in Tulsa, and asked them if they would favor a waiver or exemption for tenants working on these units, and they are very strongly supportive of it.

I think that it is something that could help, and so I would encourage you to work on that, whether you get a signoff by the building trades, or whether you just come up with an exemption, and whether it can be done administratively, or whether it takes a statutory change.

I am willing to work with you to make those changes, but I want those people that are living in those units, and who are perennially or habitually unemployed, I want them to have an opportunity at least to be able to do some of that work.

Secretary Kemp. You have my pledge to support that with every fiber of my being.

Senator Nickles. Let me ask one other question on a different subject, and again, I want to thank you for your help, and also for your attention, not just to those two units, but my concern is not with those two units in Tulsa.

We have other units in Oklahoma, and we have thousands of units across the country, and I have kind of looked under the tent and really didn't like what I saw, but I would like to clean it up, and not just in Tulsa, but I would like to clean it up nationwide.

Secretary Kemp. Well, I watched those residents give you an award for your interests in this issue, and let me say that it was an incredible experience to me to be among those folks in that neighborhood and watch them not only honor you, but pay tribute to the efforts that you are making in the State of Oklahoma on behalf of their lives and families.

Senator Nickles. I appreciate that.

Secretary Kemp. I want to support that every way we can across the country.

FHA LIMITATION

Senator Nickles. I have 7 minutes to vote. Let me ask you one quick question. Have you made a decision on the FHA limitation for next year?

Secretary Kemp. In our budget, we accepted the will of the House and Senate for an increase to $125,000 or in that range, and that is in the budget. I am going to reserve the rest of my comments about FHA ceilings until I get the product that is due as I said in response to an earlier question, and hopefully that will be in 1 week to 10 days.

Senator Nickles. Let me make one comment, and I apologize, but I am going to have to run, but recently FHA's single family mortgage insurance program has been experiencing financial difficulty. A 1988 audit of FHA showed that it lost $1.4 billion.

FHA risks have steadily increased as its equity has steadily decreased. What is HUD and the administration doing to ensure that we don't have another taxpayer bailout of a Federal program?

Secretary Kemp. Well, I am not going to dodge your question, but the actuarial study that is being undertaken, and is due literally within days, will give us not only the extent of the problem, but the range of options to deal with that problem that neither you nor I want to see reoccur.

Senator **Nickles**. One thought that I think you should look at, particularly when you talk about insuring the higher mortgages, I think you have to talk about increasing the downpayments.

You can keep a low downpayment possibly for the low income and for the smaller amounts, but when you start talking about insuring up to $100,000, or $124,000, or $150,000, or $200,000 as many people have talked about, I think that it misses part of the objective of the program if we keep it at such a low downpayment.

If you don't increase the downpayment, I think you are going to increase the future losses and liability, and that is just an observation from me.

Secretary **Kemp**. Well, that will be part of the study as well, Senator, and so I am again not trying to dodge your observation. I do want to give myself the benefit of that expert actuarial study that was due.

Senator **Nickles**. I will look forward to receiving it. I apologize. I have to vote, and so we will stand in recess subject to the return of the chair. Thank you.

[A brief recess was taken.]

Senator **Mikulski**. Mr. Secretary, we want to go into a few more issues which relate to public housing and Federal housing and then we will submit the rest for the record, because we have other obligations.

The questions—I am going to go to the public housing issues, and, first, I recognize all of your efforts to empower the people in public housing.

Secretary **Kemp**. Thank you.

Senator **Mikulski**. And move toward ownership, but as we have talked about, it was really important to make sure that public housing was fit for habitation, regardless of the future.

Secretary **Kemp**. Right.

MODERNIZATION

Senator **Mikulski**. This then takes me to the issue of modernization. HUD, as I understand it, proposes a cut of 7 percent below last year for modernization funding.

This is a cut of about $130 million when studies of your agency say that there is a tremendous backlog in this area. The backlog, not counting lead paint, which is substantial, is about $22 billion.

Also, a study done by ABT Associates indicates that this backlog will require additional money of $3 to $4 billion. So, could you tell us what your real needs are in modernization, and what the——

Secretary **Kemp**. You are right, insofar as what we requested and what we received from the Congress last year, but as I pointed out in an answer to a previous question, our request has come up considerably, and so I think that does lend evidence of our concern about the need for CIAP moneys.

I mentioned as well that we have over $3.5 billion in appropriated funds that have been obligated, and not yet spent, not even counting the $1.6 billion of the 1989 funds reserved last year, and the $1.9 billion in 1990 funds which will be reserved this year.

So, you are right, and there is a problem, and I would say that it is a huge problem, and I want to make sure that those moneys are spent, and I want to ensure that we break that logjam, and I want to make sure that we do it the right way. You would be glad to know that despite the modest difference in requests, that we have instituted a program called Operation Occupancy, which is designed in part to address a very real problem, in that we were subsidizing both CIAP and operating subsidies and PHA's, that were predicated upon vacancies in some cases.

So we have tried to make sure that they get subsidies or get incentives for moving the boards off, and rehabilitating that public housing unit, and getting a needy family into public housing in our Operation Occupancy Program.

But we are not far apart, in terms of our recognition of your basic point, which is that this is a huge problem and we want public housing residents to be treated with decency, and dignity.

Senator MIKULSKI. Well, I know that you have made yourself available and accessible to tenants of public housing to discuss their needs, and I am sure that when you made those tours that even in my own city, which was appreciated, you see a lot of boarded up housing, the basic structures are already there, and so if it is retrofitted, et cetera, we could open up lots of housing units to the poor.

In my own city as of this afternoon, they have a waiting list for public housing of 30,000 folks. That does not include section 8's, or the senior citizens, or the handicapped, but just regular families, and many of whom, sir, as you know, are the working poor.

I want to take down the boards from the buildings and facilities that our own Federal Government owns, and that's why I am so keen about modernization.

Secretary KEMP. Let me say, Barbara, that I believe that when we conclude the negotiations between the Congress and this administration, that this may very well be one of those areas of need that should be addressed at perhaps a higher level.

I am willing to work with you and improve on the way that the money is being spent, and I acknowledge the need, and acknowledge the number of people, and I acknowledge the incredible numbers of units in public housing that are in need of what you call retrofitting and rehabilitation of public housing.

And this needs our immediate attention, and I am looking forward——

Senator MIKULSKI. Well, we know that there are all kinds of budgets here and conversations going on, but I understand that my predecessors, both Senators Garn and Proxmire, appropriated money for the rehab program or the modernization program—about $3 billion.

It is already in the pipeline, and I would like to see it move faster.

Secretary KEMP. I share that sense of urgency, and I am not unsympathetic to receiving from the Congress more money for CIAP.

Senator MIKULSKI. Well, we will see what we can do there.

Secretary KEMP. OK.

OTHER PUBLIC HOUSING CONCERNS

Senator **Mikulski**. I also could talk extensively about operating subsidies, but I think that will be a topic of ongoing negotiations at other levels. Plus, again, I know your commitment to get drugs out of public housing, and Senator Lautenberg asked many of my questions, but I know that you are proposing $150 million for drug eradication, but at the same time, cutting operating subsidies—that goes right to issues like security measures.

I know the struggles that you are having with that, and if you go into any of the older apartment buildings in metropolitan areas, they are upgraded and have new security systems, and so on, and it is called for by every major landlord, but not only because of drugs, but burglaries as well.

You know, the poor are more often the victims of crime than we know.

Secretary **Kemp**. Right. Right.

Senator **Mikulski**. So, that's why we should sort of stick to the basics and——

Secretary **Kemp**. Well, I appreciate the question, and believe very strongly that we need a better way, not only in the area of CIAP moneys, and unclogging that pipeline, but in the operating subsidies.

Our program for Operation Occupancy is directly designed to make the reform, and I am a reform-minded HUD Secretary, and I would look forward to any strong message that would be forthcoming from the Congress to find a better way to work the thing ourselves at the Federal level, and the public housing authority at the local level.

WORKING WITH PUBLIC HOUSING AGENCIES

It is a source of continuing consternation that I have over how to get the public housing authorities to give up a little of their own power of bureaucracy and not give it to me or to you, but to give it to the residents.

If there needs to be more money, I don't want to see it go into empire building at the local level. I want to see it go into the problems of the residents. There will be no success in any program absent getting the residents themselves involved as part of the answer, as opposed to just looking at them as a problem.

So, I have signaled my interests in working with them, and you certainly have, and I look forward to finding ways of getting our PHA's to be more like Chicago and Omaha, Nebraska, and Dallas, and Miami.

We have gotten tremendous cooperation from some, and frankly, frankly, I would not be telling the truth if I didn't tell you that we have some real obstinate public housing authorities. The majority want to be cooperative, and there are some who are really taking us on, and I would like to work with you and find an answer to that problem.

Senator **Mikulski**. Well, we could have a long and interesting conversation on this, but I think the problems lie in a couple of areas. One, local governments still are losing more and more control to the Federal Government, and as you yourself have spoken out as a Member of the House of Representatives, the Federal Government is often long on mandates, and short on resources.

So, I think there is a sense of loss of power and control and that is very real. Second, there are others who do not share with you and I, a belief in the capacity of the poor to govern and manage their own affairs.

So, the homeownership idea is scary to some, and yet our family backgrounds are such—my great grandmother could not even speak English, but she could save her pennies and buy a house.

I believe in the capacity of these people to govern their own affairs, and so I think that is where everybody gets into their capacity to do it, and in management, and in councils, and——

Secretary **Kemp**. You have touched a responsive cord that is continually in my heart and thinking, Barbara, but I have to tell you that 2 weeks ago I went to Detroit and had on the front page of the newspapers in Detroit a public housing leader who said that we will not cooperate with Bush and Kemp in the efforts to empower the public housing residents.

I said that if he had worked for HUD that he would be gone. He would be gone. Then the mayor, who is not a Republican, Mayor Coleman Young, slapped his wrists the next day and said that he was disrespectful of low-income people.

So, I don't want to pick a fight with Peter Chase. I have been to their conventions and I tell them that we are trying to explain our programs, and your help in his area and mine—one Republican and one Democrat, and one from the administration and one from the Congress—I think can make a lot of difference in the exact role that you have of respecting the dignity and the ability of low-income people to better manage their own lives with our help in getting the boots with which to pick themselves up by.

Senator **Mikulski**. Well, we look forward to working with you on that. I just want to make one final sweep here on public housing, which deals with lead paint. My colleague, Senator Garn, raised some questions about this.

LEAD-BASED PAINT POISONING

But let me say this, Mr. Secretary, because this then goes to the human problems involved, for which you are then the landlord. Johns Hopkins tells me that if you treat a child with lead paint poisoning at Johns Hopkins Hospital, where they have a great deal of experience, the cost is about $8,000 per child.

There might be as many as three kids in one family. We have examples where families left one house and went into another, and got into the paint, and there was as much as $120,000 spent on one family.

The children are no better off after treatment, and they have suffered damage which is horrendous and often permanent.

That comes out of Medicaid, and in my conversations with Gail Wolinski, a very able new administrator at the Health Care Finance Agency, I asked her to take up the issue of lead paint as a public health measure, and also in a way of saving Medicaid costs.

Now, it comes back to us, because we, the Federal Government, are landlords now in public housing, where we know there to be lead paint. I would really like to take this opportunity to urge you to have a sense of urgency with the lead paint issue.

I think that we can do so much good with so many kids, and at the same time even save Federal dollars in the Medicaid program if we deal with this issue.

I know that you have raised the issue of asbestos and the abatement techniques, but you have had the guidelines, and I know that you have demonstration projects, and there are other methodologies for doing this.

Of course, as you know, I am not going to give you the management plan, but really I must urge that as we go through the rest of this year's budget, we begin to strengthen the capacity of your own Department in working with PHA's.

Secretary **Kemp**. Well, you know, I share the sense of urgency, Madam Chair. We are working with the HHS and EPA, and the Centers for Disease Control, and our study will be done by the end of the calendar year, and so our 1991 budget will be the first budget in the history of HUD to reflect a separate item for lead-based paint removal and treatment.

Senator **Mikulski**. Well, I think we could emerge not only in saving tragedy and saving money, but I think we could become the model landlords. Private sector landlords essentially say what do you want us to do, and what are the techniques, et cetera, and I am talking about the good guy landlords.

Secretary **Kemp**. Right.

Senator **Mikulski**. Through our work in public housing, again I think we could become model landlords and develop model communities and develop contractor expertise and contract capabilities. I have two other questions. One is related to FHA, and then the other to just overall staff needs.

FHA ISSUES

Mr. Secretary, in regard to FHA, could you tell us—well, first of all, I am just concerned about the increasing liability of FHA, and I would like to know what happens when we raise the FHA limits.

Could you discuss for us how sound you think FHA is?

Secretary **Kemp**. Well, Madam Chair, let me say that I think the system is a lot sounder than its critics have found it, but not withstanding that, I want to reserve most of my comments on this subject for the outcome of that actuarial study that I think will give us not only the extent of some of our problems and challenges, but what needs to be done, what our options are, and what response we should have. I have not done a thing that would in any way prejudice our strong belief and your strong belief that FHA should play a key role, a dramatic role, in providing access to homeownership for lower and moderate incomes, and particularly first-time buyers.

So, we share your sense of commitment to FHA, and you know that I got it out of the golf course insurance business, and I would have requested that it get out of the hospital business, and I would like to get it out of anything that does not lead to housing and homeownership opportunities for low- and moderate-income people and first-time buyers.

But most of my comments are going to have to be reserved for the results that are due and I would say within the month of May, and hopefully 10 days to maybe even 2 weeks.

Senator **Mikulski**. When the report comes out, we would like to have a copy.

Secretary **Kemp**. I am doing it for you and me. I don't have any desire to hide the results of that report.

[The information follows:]

AN ACTUARIAL REVIEW OF THE FEDERAL HOUSING ADMINISTRATION'S MUTUAL MORTGAGE INSURANCE FUND

June 6, 1990

The Honorable Jack Kemp
Secretary of Housing and Urban Development
Washington, D.C. 20410

Dear Mr. Secretary:

We are pleased to present this report on our review of the soundness of FHA's Mutual Mortgage Insurance Fund. Our analysis finds that the Fund is currently solvent due to a large surplus that was inherited from the 1970's. However, we believe that continuation of present policies will eventually lead to insolvency because new business written under existing policies is unsound.

We recommend that the MMI Fund change its policies so that it attains a capital to insurance-in-force ratio of 1.25 percent. To meet this goal, FHA needs to increase its value by about $1.35 billion relative to its financial position today.

Our report identifies alternative policies that will improve new business such that it will provide additional capital consistent with this target. These policies include:

- o Increase the premium from 3.8 percent to 6.0 percent.
- o Require a minimum downpayment of 11 percent of home price, premium, and closing costs.
- o Restructure the premium to a 1.6 percent up-front premium and 0.5 percent annually through the term of the mortgage.
- o Charge all borrowers the current 3.8 percent up-front premium and require an additional 0.5 percent annual premium to high LTV borrowers. The annual premium would be charged for the following periods:

Initial LTV	Years
0 - 90%	0
90 - 93%	4
93 - 95%	10
> 95%	15

These policies were designed to ensure that future business meets the proposed capital standard and allows continued payment of distributive shares. Smaller premium increases or lower downpayment requirements would be sufficient to meet the proposed capital standard if distributive share payments were suspended.

Our analysis is dependent to some degree on the quality of data provided to us by FHA and the forecasts of economic conditions available from various organizations. The analysis was conducted using economic models that are by their nature subject to some degree of error and may not exactly predict future behavior. These limitations are addressed in the technical appendices.

This report was prepared with the assistance of Mr. Samuel Gutterman, FSA, an actuary employed by Price Waterhouse, and Dr. Patric Hendershott of Ohio State University. If you have any questions about this report, please call Mr. Thomas Craren or Mr. James Waddell at (202) 296-0800.

Very truly yours,

Price Waterhouse

Executive Summary

This report evaluates the soundness of the Federal Housing Administration's Mutual Mortgage Insurance (MMI) Fund. The soundness of the Fund is a concern due to the magnitude of losses that FHA has recently reported. Indeed, declining house price appreciation, a major recession, and severe stress in the "oil-patch" states have caused substantial losses through the 1980's. Combine this with past poor management practices and lax monitoring, and one is left with a Fund that may not survive even moderately poor conditions, much less a major economic problem. The lessons learned from the 1980's are important. No longer can (or should) FHA rely on inflation or rapid house appreciation to save mortgages that are poorly underwritten, improperly monitored, and excessively risky.

This study was undertaken to learn why MMI suffered these large losses, to assess the likelihood of MMI suffering more losses from its 1980's business, and to determine whether the combination of recent losses and anticipated future losses have rendered MMI fundamentally unsound. The value of business currently being written is estimated, and policy options to strengthen the Fund are considered.

Any analysis of the MMI Fund must recognize that FHA's public purpose can be, and often is, at odds with its statutory requirement to be sound. But taking on risks that the revenue of the Fund simply cannot support will eventually lead to the Fund's reliance on the Treasury or on budget appropriations to sustain its operations. While reliance on the Treasury to cover catastrophic conditions might be appropriate in the most severe circumstances, we believe that, given current statutory requirements, MMI must (at a minimum) maintain enough equity to withstand, on its own, moderately severe economic conditions.

In order to evaluate the soundness of the Fund, we developed detailed statistical models that quantify the effect of loan characteristics and economic factors on defaults and prepayments. Default is explained primarily by the equity position of the borrower, which depends on the initial downpayment of the borrower and changes in house prices and, to some extent, interest rates after purchase. Prepayments are determined to a large extent by changes in interest rates.

The economic climate that underlies our analysis was derived from projections by the National Association of Realtors, the Mortgage Bankers Association, the Congressional Budget Office (CBO), and the Office of Management and Budget (OMB). These organizations publish forecasts of interest rates, house price inflation rates, and unemployment rates, although CBO and OMB publish consumer price rather than house price inflation rates. Because all of these forecasts were in a narrow range, we refer to the baseline forecast as the "consensus" economic scenario.

Based on our analysis of defaults, prepayments, and MMI's financial position, we have concluded the following:

- The Fund is currently solvent under consensus economics. That is, the Fund will have a positive value if it writes no new business and uses its current resources to pay claims expected to occur over the life of the existing loans.

The portfolio of insurance-in-force has a positive value only because it had developed a substantial equity position from the business written before 1980. As of the beginning of the 1980's, business already insured by MMI had an economic value of $3.4 billion. This represented 5.3 percent of unamortized insurance-in-force. Invested at one-year Treasury rates, this value would have grown to $8.0 billion by the end of the 1980's. However, this potential value has been eroded to about $2.6 billion in 1989 (see Exhibit ES-1) or only one percent of unamortized insurance-in-force.

There is no single standard of actuarial soundness. We have derived guidelines for MMI's soundness based on the need to withstand adverse conditions. These guidelines require MMI to have positive economic value even if adverse economic conditions develop. The capital required to meet this test, with some margin for error, is $3.75 billion or 1.25 percent of insurance-in-force. Current economic value of $2.6 billion is short of this requirement. That is, the MMI Fund is not currently sound.

The MMI Fund is currently paying distributive shares on pre-1989 business (primarily relating to years 1979 and prior). The present value of these expected future payments is $1.3 billion. To the extent payment of distributive shares is continued, terms on new business will have to be tightened further in order to cover the payments and continue to build equity at the 1.25 percent level.

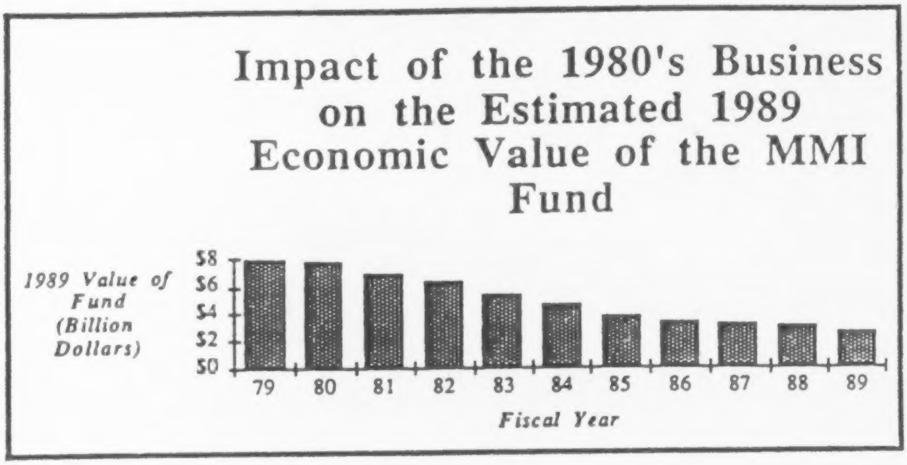
The business written each year is unsound. Under the consensus economic scenario, the 1990 business is expected to have a value of negative $208 million. Under a less favorable -- but reasonably possible -- scenario the business will have a value of negative $667 million. Business written beyond 1990 of similar size and risk composition will also face losses.

It is crucial that new business be put on a sound footing as soon as possible. To comply with the above guideline and suspension of distributive shares, the present value of new business each year must improve by about $625 million. If distributive shares are continued, another $135 million will be needed. This both offsets the $208 million loss and allows equity to build by 1.25 percent of the net additional business ($48 billion new insurance less $15 billion estimated terminations). Alternative policies that would approximately achieve this result including the payment of distributive shares are:

- Increase the premium from 3.8 percent to 6.0 percent
- Require a 11 percent downpayment on the house price, premium, and closing costs
- Restructure the premium to be 1.60 percent up-front and 0.5 percent annually through the term of the mortgage.
- Charge the 3.8 percent up-front premium to all borrowers and an additional annual premium of 0.5 percent based on the riskiness of the loan. Loans with FHA-defined LTVs less than 90% would pay no additional premium, loans with LTVs between 90% and 93% would pay the annual premium for four years, LTVs between 93% and 95% would pay the annual premium for ten years, and LTVs greater than 95% would pay the annual premium for fifteen years.

Management reforms could significantly reduce the losses on the disposition of properties. Such reforms could both improve the soundness of the existing Fund and could lead to lower premiums on new MMI business. Their implementation should receive high priority at FHA.

EXHIBIT ES-1



Note: This exhibit illustrates the estimated economic value of the portfolio as of the end of the year indicated, plus interest earned between that year and 1989. This exhibit excludes the effect of distributive shares.

[The balance of the report is being retained in the subcommittee files.]

STATUS OF FHA PROPERTIES

Senator Mikulski. Now, the other concern that we have for FHA is the fact that essentially you are taking back FHA single residences, and that there are problems there. Would you tell us what your intention is to do with these properties, because I am concerned that we could end up with us being an unintended landlord of properties.

Secretary Kemp. I am going to ask Austin Fitts to join me at the table and comment or elaborate. We want at least 10 percent of those FHA properties to be used for homeless providers, including nonprofits, but, Austin——

Senator Mikulski. Do you know the size of the problem, and is it located in certain geographic areas, and if you had time could you turn these lemons into lemonade?

Ms. Fitts. Senator, that is an excellent question. Currently FHA takes back approximately 85,000 single family homes a year, and sells them at approximately an equivalent amount. We run inventories or have a balance of approximately 50,000.

Those homes and the inventories to buy are about 2½ percent of the conventional single family sales in the country annually. The majority of that volume is in the oil patch States and Alaska. So, we have fairly large inventories in Texas, Colorado, Oklahoma, and Louisiana.

Right now we are working very hard to increase the efficiencies in that operation, both—particularly in the marketing and management of those properties. We take great losses, to the extent that we have a slow turnover in our inventory, and we are trying to do things to lessen it. We want to increase the turnover, but lessen the inventory.

LEASING OF PROPERTIES

As the Secretary mentioned, we are also trying to do some creative leasing. We issued regulations earlier this year on a leasing program for the homeless, and we hope to do approximately 10 percent of inventories in the lease and lease-purchase programs.

Finally, what you will notice in the HOPE proposal is that we propose to take——

Senator **Mikulski**. Can I ask you about leasing? Are you referring to leasing to individual families, or are you talking about leasing to nonprofits?

Ms. **Fitts**. It would be leasing to nonprofit organizations.

Senator **Mikulski**. Who would then put the tenants in and provide proper services?

Ms. **Fitts**. Yes; and provide the proper services, and it would be a lease-purchase option, and so if they fix up the home, they would have the opportunity for homeownership at the original price of the home, rather than we recouping the benefits of their, if you will, sweat.

As you have seen in the HOPE proposal, we are proposing a portion of the HOPE to be combined with a variety of Federal inventories, including that of FHA, to do some very creative things with this inventory, and as you would say, turning a potential lemon into lemonade.

Secretary **Kemp**. There is tremendous work being done by nonprofits around the country and taking these properties and converting them quickly into rehabilitative units for the homeless or low-income people.

I just came from Milwaukee, WI, where they have done incredible work through nonprofit agencies, and so Austin Fitts and I are totally committed to the type of utilization of some of these properties, and on my role on the RTC Oversight Board, as well as the Federal Housing Project Coordinator, in trying to find some more innovative ways to work with State housing financial agencies, as well as nonprofits, to move low-income people into housing and homeownership.

RATE OF DEFAULT IN FHA

Senator **Mikulski**. Well, this Committee, and certainly this particular chair, is very concerned about the rate of default in FHA, and then in other categories, such as VA loan defaults, which have actually doubled, and then with the RTC, although that is not as much as single-family properties.

Secretary **Kemp**. Right.

Senator **Mikulski**. The two most important totals that the Federal Government is concerned with is first-time home buyers in VA and FHA.

Secretary **Kemp**. Madam Chair, may I say to you in all sincerity, that I think we are going to know a lot more about the extent of the problem, and the extent of the challenge, and the health of our trust funds when we get this report done.

I am not trying to evade the question, but I am anxious to work with you, and you will have the report as soon as I get it, and we look forward to working with you, and we have a Commissioner and a Secretary who are absolutely committed to making FHA in the 1990's what it was set up to be in its genesis.

Senator **Mikulski**. Well, first of all, we were looking for your navigational chart for FHA, and this gives us the direction that you are going in, and the Federal liability, and then I hope that the Chief of FHA can learn for VA, as the expertise at VA is not housing. It is really primarily benefits and medical care.

So, you are really going to be the model for what we would hope that Secretary Derwinski and his team would be looking at.

FHA LIMITATION

My last question about FHA though is the consequences of what we did last year when we raised the single family mortgage limits. As you know, there are all kinds of comments; some very positive, and some very negative.

Do you have any information yet whether what we did was a help or a hurt to FHA, or again, will that be raised in that study again?

Secretary **Kemp**. Madam Chair, that will be very much on the plane of actuarial study. I would urge that we all suspend our judgment about what had happened last year until we get better results, or get the results of that study.

Senator **Mikulski**. Well, why don't we agree to do this. When the Price-Waterhouse study comes out, how about we all talk again as to what does it mean in terms of some of the problems that we need to decide, and we want to be sure that when we raise those limits, we have to decide if we should retain them, and what are the consequences?

Secretary **Kemp**. Right. The range of options that we have at our disposal.

STAFFING NEEDS

Senator **Mikulski**. Well, I could talk to you about fair housing, and elderly housing and so forth, but we are going to wrap up with your staff needs, just to be sure that you have adequate people to do your job, and that goes to some of the points that Mr. DelliBovi has raised, and I know that Ms. Fitts' shop at FHA will take a great deal of people.

I know that you have a 202 backlog that you are trying to deal with, and HUD has requested an increase of over 700 staff-years in 1991, but is being asked to absorb 50 percent of their 1991 pay raises.

Could you tell us your total request to OMB over the 1990 appropriations for staffing?

Secretary **Kemp**. We think it is in the range of 900.

Mr. **DelliBovi**. We requested about 175 more than we received from OMB.

Secretary **Kemp**. Our original request to OMB for 1991 staffing was 14,393 staff-years, and our 1991 budget is for 14,218, and so it is 175 staff-years less than the request was.

Senator **Mikulski**. OK. So, it is 175?

Secretary **Kemp**. Right.

Senator **Mikulski**. What are the dollar figures that you are being asked to absorb for the 1991 pay raise, and if you have to absorb this amount, how many new staff-years will have to take a cut from that?

Secretary **Kemp**. Al Kliman, go ahead with that.

Mr. **Kliman**. The budget reflects absorbtion of 50 percent of the pay raise, and that is $8.2 million. Last year the budget reflected absorbing 100 percent of the pay raise. If $8.2 million turns into staff-years that we have to eat, it would be in excess of 100 staff-years—150 to 170 staff-years.

Senator **Mikulski**. So, it would cut out 100 of your 700?

Mr. **Kliman**. It depends on what happens with reductions from sequestrations. If we can get through this next year without sequestrations, then we will have enough wiggle room to be able to live.

If we get hit with sequestrations again we are in deep trouble.

Senator **Mikulski**. Last year, we increased your staff——

Secretary **Kemp**. We will be able to——

Senator **Mikulski**. I know that you are a good soldier.

Secretary **Kemp**. Well, I am not only a good soldier, but I don't have the same impression about how much trouble we might be in.

Senator **Mikulski**. Well, let me go through this, Mr. Secretary, because I know that you want to expand opportunity, and we agree with that, but when we look at your needs from the way it happened under your predecessor, the staff had been devastated, and you needed more people and we added more people.

Then along came sequester, and from what I understand, sequester wiped out the personnel add-on's that we had funded for fiscal year 1990.

Then as you went through this year's budget request, you went to OMB and you asked for 875 staff-years. OMB said you could go to Congress and ask for 700. Then if you absorb one-half the pay raise, you are talking about even knocking out another 200, or 100. So, that is really a deduction of 225 from that you requested.

Last year what we gave you was wiped out by sequester, and now here what you are asking is going to be wiped out, and I just want to make sure that you have enough qualified people to do the work of what is turning into an enormous task.

I am sure that when you took over the job that you are running into problems that——

Secretary **Kemp**. Well, you have to take into consideration that we did not approach this from a scorched Earth policy, but we have stopped programs, and we have reformed programs, and we have energized, we believe, the Department.

I don't want to cry wolf about sequestration, and I don't want to underestimate the need for the staff-years that we have requested, but I believe that we can continue to make progress with the requests that we have made, notwithstanding the fact that I need to tell you that it isn't more bodies at HUD that is going to save that Department.

It is the proper application, and I don't want to sound as if it is all spirit and determination, but that is going to be ultimately a lot of the answer, and getting people to perform at a level consistent with the high quality of the mandate that you have given to us, as well as the President.

Senator **Mikulski**. I understand that, but you are going to have to be taking a very close look at—I mean, once Price-Waterhouse comes out, I am sure that we can find significant issues that we are going to have to work with in FHA.

You have already been given the congressional responsibility for implementing the fair housing law.

Secretary **Kemp**. Right.

Senator **Mikulski**. I am sure that you have heard as many complaints about that as I have, about the need to have very clear guidelines for representation, and regional offices need to be trained, and good guy landlords are asking for workshops, so that they can apply.

Homebuilders are going up the wall, and I mean, just in that area alone, and I am not saying, you know, that you are going to need people to implement the role that Congress gives you.

That area alone, and I am sure that you have heard as I said before, and I am not telling you where to allocate your staff——

Secretary **Kemp**. No; I know that.

Senator **Mikulski**. But those certainly are the kinds of things that we are talking about with the additional people.

Secretary **Kemp**. In the answer to this question previously, I made the statement that some of the most critical increases have been in housing, where we have asked for an increase of 460 staff-years, and fair housing we asked for 55, and in the Office of the Inspector General—I mean, those are three critical areas, and data processing is important as almost the staff-year increases.

Senator **Mikulski**. Well, right now we are still waiting for our budget, and we don't even have a 302(a), and I don't have a 302(b). First of all, we thank you for your participation and to the members of your staff.

ADDITIONAL COMMITTEE QUESTIONS

We have other questions for the record, and then there will be a necessity for other conversations as we move through this appropriation. We want to thank you for coming, and your remarks in your opening statement were certainly well-taken by this committee.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR MIKULSKI

OMB REQUEST FOR HOUSING

SENATOR MIKULSKI: Please provide for the record a table that compares the following data for the "Annual contributions for assisted housing" account which includes all programs and items included in this account by the FY 1990 Conference Report; HUD's 1990 OMB request; the 1990 appropriation; the 1990 operating plan; HUD's September 1st 1991 OMB request; and the 1991 budget request.

ANSWER: Please reference the table below.

ANNUAL CONTIBUTIONS FOR ASSISTED HOUSING
FY 1991 - GROSS RESERVATIONS
REQUEST TO OMB VS. REQUEST TO CONGRESS

	SEPTEMBER 1 REQUEST		CONGRESSIONAL JUSTIFICATIONS	
	Units	Budget Authority	Units	Budget Authority
Recaptures..........................	NA	290,438,000	NA	$236,375,000
Rescission of Recaptures...........	NA	(290,438,000)	NA	(236,375,000)
New Authority.......................	NA	17,568,221,716	NA	13,286,874,000
Transfer from Section 236 RHAF.....	NA	NA	NA	70,000,000
Transfer from Section 312..........	NA	NA	NA	87,000,000
Transfer to PD&R...................	NA	NA	NA	(17,545,000)
Total Available..................	NA	17,568,221,716	NA	13,426,329,000
Public/Indian Housing				
Amendments..........................	NA	57,000,000	NA	57,000,000
Lease Adjustments..................	NA	25,100,000	NA	25,100,000
Modernization......................	NA	[2,000,000,000]	NA	[1,847,492,000]
Subtotal, Public/Indian..........	NA	82,100,000	NA	82,100,000
Section 8 and Other Programs				
Section 8 Elderly:				
New Construction..................	5,520 *	803,933,000	3,097 *	457,678,752
Leased Units......................	NA	NA	1,700 *	60,919,500
Amendments........................	NA	186,000,000	NA	186,000,000
Subtotal Elderly...............	5,520	989,933,000	4,797	704,798,252
Section 162 Handicapped [202(h)]:				
New Construction................	1,840 *	294,731,000	870 *	139,370,348
Mentally Ill (leased units).....	500 *	17,917,500	300 *	10,750,500
Shelter Plus Care [HOPE]........	NA	NA	1,000 *	35,835,000
Amendments......................	NA	52,000,000	NA	52,000,000
Subtotal Handicapped...........	2,340	364,648,500	2,170	237,955,848
Subtotal, Section 202......	7,860	1,354,581,500	6,967	942,754,100

Vouchers:				
Incremental........................	68,153 *	1,759,268,075	43,258 *	1,276,814,380
Frail Elderly set-aside [HOPE]...	NA	NA	[1,500]	[34,050,000]
Rental Housing Asst. [HOPE]a/.....	NA	NA	[6,600]	[161,000,000]
Public Hsg. Homeowner. [HOPE].....	1,500	39,782,500	1,666 *	54,929,750
P.H. Transitional [HOPE]..........	3,000	78,765,000	3,000 *	87,375,000
Public Housing Relocation.........	2,500	65,637,500	4,000	116,500,000
Opt Outs..........................	1,000	26,253,695	1,000	29,125,000
FHA Fees b/.......................	NA	218,559,110	NA	NA
Subtotal, Vouchers...........	76,153	2,217,865,890	52,924	1,564,744,130
Voucher Homeownership/Prepayment...	30,500	997,000,000	NA	NA
[Rental Hsg. Asst. for Homeless]...	NA	NA	[6,600]	[160,782,000]
Preservation/Homeownership [HOPE]..	NA	NA	12,500 *	411,740,500
Property Disposition/Homeownership.	NA	NA	10,000 *	329,390,000
Certificates:				
Incremental Certificates..........	22,671 *	701,554,095	6,889 *	213,191,870
P. H. Demolition/Disposition......	2,900	283,402,500	1,400	45,605,000
Homeowner Repl. [HOPE]............	1,500	146,587,500	1,114 *	108,865,700
Subtotal, Certificates.........	27,071	1,131,544,095	9,403	367,662,570
Moderate Rehabilitation:				
Single Room Occupancy [HOPE]......	1,316 *	50,000,000	1,305 *	49,571,300
Loan Management:				
Default Prevention................	10,000	220,300,000	5,000	110,150,000
Property Disposition...............	10,000	1,037,235,300	NA	NA
Section 23 Conversions	1,300	22,789,013	1,300	22,789,000
Contract Renewals:				
Loan Management...................	NA	NA	[123,522]	3,102,872,600
Certificates......................	NA	NA	[136,490]	3,654,519,750
Vouchers..........................	NA	NA	[34,483]	977,593,050
Subtotal, Renewals...........	[329,294]	8,663,305,928	[294,495]	7,734,985,400
Amendments:				
Existing Housing..................	NA	759,000,000	NA	768,000,000
Rainer View Requirements..........	NA	150,000,000	NA	70,000,000
Project Reserves	NA	800,000,000	NA	889,942,000
Moderate Rehab....................	NA	62,000,000	NA	62,000,000
Property Disposition	NA	20,500,000	NA	20,500,000
Subtotal, Amendments........	NA	1,791,500,000	NA	1,810,442,000
Subtotal, Section 8 and Other....	164,200	17,486,121,716	99,399	13,344,229,000
Total, All Programs............	164,200	17,568,221,716	99,399	13,426,329,000

Incremental Units (*):		
Annual contributions programs....	100,000	75,449
Homeless units....................	NA	6,600
	------	------
Total..........................	100,000	82,049

a/ New Voucher program for the homeless funded under separate account.

b/ Included within total voucher costs in Congressional Justifications.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
COMPARISON OF 1990 BUDGET REQUEST, APPROPRIATION AND OPERATING PLAN

	SEPTEMBER 1 REQUEST		1990 CONFERENCE REPORT		1990 APPROPRIATION a/b/		1990 OPERATING PLAN c/	
	Units	Budget Authority	Units	Budget Authority	Units	Budget Authority	Units	Budget Authority
Recaptures..........................	NA	221,500,000	NA	221,500,000	NA	221,500,000	NA	311,226,099
Rescission of Recaptures...........	NA	(221,500,000)	NA	(221,500,000)	NA	(221,500,000)	NA	(311,226,099)
Carryover...........................	NA	NA	NA	NA	NA	NA	NA	881,069,732
New Budget Authority................	NA	10,457,426,000	NA	8,115,221,525	NA	7,873,855,431	NA	7,873,855,431
Total, Available.................		10,457,426,000		8,115,221,525		7,873,855,431		8,754,925,163
Public Housing								
Public Housing.....................	... *	...	6,500 *	457,717,000	6,293 *	443,058,110	6,293 *	443,209,653
Indian Housing.....................	1,000 *	79,372,000	1,800 *	134,373,600	1,742 *	130,098,036	1,822 *	136,099,095
Amendments.........................	NA	39,836,500	NA	184,000,000	NA	178,844,828	NA	179,098,993
Lease Adjustments..................	NA	21,000,000	NA	21,000,000	NA	20,411,638	NA	20,520,794
Modernization d/...................	NA	2,000,000,000	NA	2,032,500,000	NA	1,975,554,964	NA	1,975,765,264
Subtotal, Public Housing.....	1,000 *	2,140,208,500	8,300	2,829,590,600	8,035 *	2,747,967,576	8,115 *	2,754,693,799
Section 8 and Other:								
Section 202: e/								
Section 202-Regular............./	6,800 *	952,136,000	6,375 *	883,830,000	6,172 *	855,707,872	5,573 *	905,597,227
Amendments......................	NA	180,000,000	NA	180,000,000	NA	174,956,897	NA	318,945,177
Section 202-Handicapped.........	2,500 *	385,050,000	2,125 *	324,062,500	2,057 *	313,751,324	2,096 *	313,758,324
Amendments......................	NA	50,000,000	NA	50,000,000	NA	48,599,138	NA	48,579,138
Subtotal, Section 202.......	9,300 *	1,567,186,000	8,500 *	1,437,892,500	8,229 *	1,393,015,231	7,689 *	1,586,889,866
Vouchers:								
Incremental.....................	132,000 *	3,299,440,000	23,760 *	675,853,200	23,005 *	654,348,578	23,072 *	656,249,965
Opt Outs/Prepayments/Relocation	8,500	211,820,000	3,750	106,668,750	3,645	103,680,186	4,451	126,599,258
Renewals........................	NA	NA	NA	NA	NA	NA	NA	1,433,630
P. H. Demolit/Dispo.............	2,500	62,300,000	NA	NA	NA	NA	NA	NA
Replacement Vouchers............	NA	654,596,000	NA	NA	NA	NA	NA	NA
Voucher FHA Fees (7.65%)........	NA	393,395,000			NA	NA	NA	NA
Subtotal, Vouchers........	143,000	4,613,551,000	27,510	782,521,950	26,650	758,028,764	27,523	784,282,853
Existing Certificates:								
Incremental.....................	NA *	NA	33,000 *	988,680,000	31,951 *	957,221,705	30,523 *	914,442,236
Opt Outs/Prepayments/Relocation	NA	NA	3,750	112,350,000	3,645	109,202,262	3,645	109,202,262
P. H. Homeownership.............	NA	NA	NA	NA	NA	NA	2,000 *	59,930,409
Public Housing Demol./Disp Replacement Certs. (15 yr.)....	NA	NA	500	47,302,500	486	45,977,215	543	51,410,675
Subtotal, Certificates.......	NA	NA	37,250	1,148,332,500	36,082	1,112,401,182	36,711	1,134,985,542
Loan Management (default servicing)	7,000	139,720,000	6,000 **	143,490,000	5,809	138,924,367	7,745	185,226,902
Property Disposition...............	5,200	521,118,000	3,157	318,545,152	3,083	309,620,397	6,123	614,910,237
Section 23 Conversions (5 yr.).....	1,500	97,222,500	400	6,788,000	389	6,597,819	1,525	11,030,500
Moderate Rehabilitation								
Regular...........................	NA	NA	NA	NA	NA	NA	2,114 *	240,717,010
Homeless (SRO)....................	2,000 *	73,420,000	NA	NA	NA	NA	1 *	22,400
Amendments:								
New/Sub. Rehab....................	NA	NA	NA		NA	NA	NA	3,918,229
Existing Housing..................	NA	775,000,000	NA	734,760,000	NA	714,174,054	NA	722,648,406
Project Reserves	NA	450,000,000	NA	550,800,823	NA	535,368,905	NA	539,832,664

Moderate Rehab....................	NA	60,000,000	NA	67,500,000	NA	65,698,836	NA	69,696,660
Property Disposition..............	NA	20,000,000	NA	20,000,000	NA	19,439,655	NA	23,454,470
Subtotal, Amendments..........	NA	1,305,000,000	NA	1,373,060,823	NA	1,324,591,451	NA	1,369,552,441
Subtotal, Section 8...........	168,000	8,317,717,500	82,817	5,210,630,925	80,242	5,053,179,210	89,441	5,927,617,750
Total, Public Housing and Sec. 8...	169,000	10,457,426,000	91,117	8,040,221,525	88,277	7,801,146,786	97,556	8,682,311,549
Nehemiah Grants....................	NA	NA	NA	25,000,000	NA	24,299,569	NA	24,204,539
Drug Elimination Grants............	NA	NA	NA	50,000,000	NA	48,409,076	NA	49,409,076
Total, Annual Contributions.....	169,000	10,457,426,000	91,117	8,115,221,525	88,277	7,873,855,431	97,556	8,754,925,163
Moderate Rehabilitation								
Single Room Occupancy f/..........	[NA]*	[NA]	[2,044]*	[75,000,000]	[1,994]*	[73,185,059]	[1,994]*	[73,185,059]
Section 8 Contract Renewals: f/								
Certificates......................	[NA]	[NA]	[NA]	[NA]	[19,980]	[509,485,804]	[19,980]	[509,485,804]
Vouchers..........................	[NA]	[NA]	[NA]	[NA]	[16,369]	[441,952,380]	[16,369]	[441,952,380]
Loan Management...................	[NA]	[NA]	[NA]	[NA]	[5,143]	[123,053,326]	[5,143]	[123,053,326]
Subtotal, Renewals...........	[NA]	[NA]	[NA]	[1,091,978,475]	[41,492]	[1,074,491,510]	[41,492]	[1,074,491,510]
Total, All Programs............	169,000	10,457,426,000	93,161	9,282,200,000	90,271	9,021,532,000	99,550	9,902,601,732
Incremental Units (*) (Without LM).	146,300	4,852,838,000	75,604	3,539,516,300	73,214	3,427,370,683	75,559	3,743,201,377
Incremental Units (With LM)........	153,300	4,992,358,000	81,604	3,683,006,300	79,023	3,566,295,050	83,253	3,928,429,278

a/ Net of Section 517 reduction, Sequestration and $14 million transfer to Salaries and Expenses.
b/ Does not reflect impact of Supplemental Appropriations for 1990.
c/ Reflects original Operating Plan Submitted to Congress with the 1991 Budget Justifications.
d/ Includes Technical Assistance and Training.
e/ Reflects reprogramming of Section 202 carryover into amendments
to allow for increases in fair market rents for Section 202 pipeline projects.
f/ Appropriated as separate accounts for fiscal year 1990.

PREPAYMENT OF 231/236 MORTGAGES

SENATOR MIKULSKI: What accounts for the decrease of 31,000 units in your estimate of the prepayment "pool" between this year and last?

ANSWER: In the fiscal year 1990 Appropriations hearing the Secretary testified that around 360,000 units would be eligible to prepay through fiscal year 2006. We stand by this estimate. The data supporting this estimate has undergone some revisions, with some projects added and deleted, but the overall total eligible units is still approximately 360,000.

The 334,000 unit estimate appeared in a 1987 Congressional Budget Office study (see "Potential Losses from the Rental Housing Inventory: Soundness of Current Estimates, GAO/T-PEMD-90-8). We believe their estimate originated from the same HUD data file that produced the 360,000 unit estimate, but did not reflect eligible units through the year 2006.

SENATOR MIKULSKI: The Hills - Reuss Commission said there would likely be 243,000 actual prepayments, but HUD says the number is only 154,000. What's the basis for HUD's estimate and why the difference with former Secretary Hills' estimate, a difference of over 36%?

ANSWER: We are continually refining our estimate, which has now increased to slightly over 155,000. In any event, while both studies attempted to estimate the number of prepayments, we have not been given access to the programming or the assumptions behind the Hill - Reuss model so we do not know why they are different.

HUD's assumptions are based on a 1987 survey, described in response to a later question, which takes into account a number of factors, each of which will affect an owner's decision to prepay.

SENATOR MIKULSKI: Since every project prepayment requires the Secretary to approve a specific "plan of action" before permitting an actual prepayment, I would like to know how many "plans of action" you project you'll approve in FY 90 and how many in FY 91?

ANSWER: Again, the estimate of the number of prepayments is continually being refined as we receive more information. Our current estimate--based on the prepayment plans of action received to date and assuming an extension of current prepayment guidelines from the 1987 Act--is that 26 projects will be approved for prepayment in 1990 and 27 in 1991.

PREPAYMENT INCENTIVES

SENATOR MIKULSKI: Suppose for a moment that "HOPE" is not approved before the moratorium expires. What kinds of existing housing subsidy programs, and what amounts, will you need to deal with the prepayment issue in 1991? What about 1992 and 1993?

ANSWER: If the current prepayment legislation is extended, the inducements that the Department could use to encourage project owners not to prepay include: (1) Section 8 loan management assistance; (2) FHA insurance for specific types of loans; and (3) modification of regulatory agreements.

The Section 8 loan management assistance can be provided for units in these projects that are not currently receiving subsidy based on eligible tenants or to amend contracts to bring units currently receiving subsidy up to an appropriate level. Section 8 assistance can also be used to extend the term of Section 8 contracts and to enable the tenants to afford the rents.

Based on our analysis of very low-income (50 percent of National Median Income of less) tenant composition in projects for which we have received Notices of Intent to Prepay for 1991, 1992 and 1993, we estimate the following:

	Units	Budget Authority (5-year)
1991		
New Section 8	8,620	$334,540,680
Contract Amendments	7,895	60,808,493
1992		
New Section 8	3,942	143,330,022
Contract Amendments	2,678	21,452,103
1993		
New Section 8	5,469	206,812,121
Contract Amendments	3,715	30,953,424

In addition to the Section 8 assistance, FHA insurance under the Section 241(d) Supplement Loan program could be used as an incentive as well as the Section 241(f) Equity Loan program. The proceeds of the loans could be used by owners to finance project improvements.

Modification of regulatory agreements would allow owners to receive an increased rate of return on their investments and/or increase the owner's access to cash generated by or held in reserve for the property.

SENATOR MIKULSKI: Since there's a projected four-fold increase in prepayments expected from 1990 to 1991, do you plan a four-fold increase in the staff who will work on this?

ANSWER: For Headquarters, we are projecting an increase of at least three more positions in the near term for a total of nine. For the Field, the Budget includes a staff-year request which would nearly double the Field Staff (from 21.3 in 1990 to 41.3 in 1991). Moreover, we are refining and standardizing the review process, so that existing staff will be able to handle these cases with greatly increased efficiency. Considering all these factors, we feel that adequate staff will be available to process the prepayments.

SENATOR MIKULSKI: If so, does this mean staff will be diverted from other projects? Which ones?

ANSWER: We believe, given the level of staff requested in the Budget, that as existing staff are fully trained and new staff are brought up to full capacity, we can handle projected workload for 1991.

SENATOR MIKULSKI: How many people do you currently have who are trained to handle these plans of action?

ANSWER: For Headquarters we have three trained staff professionals and an additional three new staff members who are currently in training. In the Field there are, as of April 1990, the equivalent of five staff years working on preservation.

SENATOR MIKULSKI: In each of these areas, what did you request from OMB in your September 1 submission for 1991 and why did you choose those particular amounts?

ANSWER: The Department's OMB submission included a substantial commitment to preserving housing for low-income households, much of which became part of the Department's 1991 Budget proposal. Increasing homeownership opportunities through HOPE was an integral part of the plan.

However, with respect to the specific options identified in the previous response, the Department requested 10,000 loan management Section 8 units at a cost of $220 million. The Budget also assumed availability of the Section 241(d) supplemental loan program and the Section 241(f) equity loan program as prepayment prevention incentives. However, budget estimates as to the amount of insurance activity which could be expected were produced down to this level of detail. Also, modification agreements were assumed to be an available option but separately identified in the budget projections.

The loan management estimate of 10,000 units included in the OMB submission was judged to be sufficient to meet the requirements of the 1987 HCD Act and McKinney Amendments as they applied to both subsidized and unsubsidized projects. In view of the emphasis given to preservation under HOPE initiatives in the 1991 Budget and the proposals to amend the preservation legislation, the loan management proposal was changed to 5,000 units for default prevention activities.

SENATOR MIKULSKI: What kind of change in market or economic conditions would force the number of prepayments to increase?

ANSWER: In general, a geographic area with a healthy rental market and a low vacancy rate would experience an increase in the number of prepayments. These are areas where an owner would be able to get higher rents from market-rate rents. If, for example, we have an economic up-turn in selected "soft" markets, e.g., Houston, Denver, Oklahoma City, Phoenix, New Orleans, we can expect a higher level of prepayment activity in these areas than we are now projecting. Currently, in these areas there are few economic alternatives for owners because market rents and occupancy levels are depressed.

SENATOR MIKULSKI: What is the Department's estimate of the total number of units in buildings eligible to prepay their mortgages in fiscal years 1991, 1992, 1993, 1994 and 1995?

ANSWER: The following lists by year a recently revised estimate of the number of 221(d)(3) and 236 mortgages eligible to prepay and the number of units in those buildings. This is the total number of mortgages which will reach the twentieth year of the 40-year mortgage term during those years.

Fiscal Years	**Mortgages**	**Units**
1991	396	45,134
1992	489	49,375
1993	534	55,857
1994	672	70,726
1995	262	29,307

SENATOR MIKULSKI: Why does HUD believe only one-half of the units eligible to prepay will actually do so? Has the Department done analyses of individual projects, their debt service, location, modernization needs, rental income - to determine its estimate?

ANSWER: The Office of Multifamily Housing Management in 1987, questioned the Field regarding the prepayment issue and its effect on the Low Income Housing Portfolio.

The Loan Management staff at the Field office level were asked a series of questions. The questions covered such things as:

1. The physical condition of each eligible project;
2. Type of construction i.e., Hi-Rise, Garden, or Townhouse;
3. The physical condition of the housing stock in the area of each property;
4. A grading of the safety of the area: high, middle, moderate, low;
5. Rent levels in the area: high, middle, moderate, low;
6. Access to commercial areas;
7. Availability of public transportation;
8. Proximity to downtown, schools, public amenities;
9. Identification of any negative features in the area; and

10. Whether the Loan Management Staff thought the owner would would want to prepay.

The next series of questions dealt with Rental Project Financial Information.

1. Breakdown of the FHA approval rents for all sizes of units;

2. The existing Section 8 FMR for each size unit in the project;

3. The mortgage balance, amount in reserve for replacement, gross and per unit;

4. The amount of residual receipts.

5. If HUD had provided Flexible Subsidy and the amount;

6. If the project had tax abatement;

7. If the owner was local;

8. If the management was local; and

9. Last 5-year record of limited dividend payments to investors.

The third series of questions was based on tenant information.

HUD gave various weights to the information it received on the projects, analyzed it, and divided the projects into the following four categories:

	Mortgages	**Units**
1. Owner will prepay	705	79,085
2. Owner likely to prepay	721	76,228
3. Owner unlikely to prepay	259	28,000
4. Owner won't prepay	1,207	131,865

1,207 projects with 131,865 units were not in jeopardy of prepayment.

TENANT PARTICIPATION IN HOMEOWNERSHIP

SENATOR MIKULSKI: If not all of the Section 8 assisted tenants in a building eligible to prepay want to purchase the building, what assistance does the HUD budget provide for them: How many tenants does the Department estimate will not want to purchase their unit (of the 6,250 it estimates are eligible)?

ANSWER: The 6,250 prepayment/preservation units cited in the budget do not represent the number of tenants eligible for unit purchase. This represents the number of incremental units estimated to be supported under the Preservation Through Homeownership proposal. There is no estimate at this time as to the number of individuals who might choose to not participate in homeownership.

The legislative proposal requires that at least 75 percent of the project's tenants must elect for homeownership before homeownership assistance will be provided.

In addition to providing a portion of the available funding for project acquisition and/or rehabilitation, the program does provide options for these tenants electing not to purchase. Vouchers will be made available for non-purchasing tenants to remain in their project or at another location of their choosing.

SENATOR MIKULSKI: On what is that estimate based?

ANSWER: As noted in the response to the previous question, there is no estimate as to the number of tenants who will choose not to purchase. The number of tenants exercising this option will depend on a number of indeterminables--the number of projects purchased, how many owners elect to prepay, how many accept incentives to not prepay, how many tenants decide to purchase, etc.

SENATOR MIKULSKI: Why is the cost of the vouchers needed to support preservation of units (Section 236 and 221(d)(3)) not included as part of the HOPE proposals? ($329 million is included in the HUD Budget under "property disposition.")

ANSWER: The Department's preservation/prepayment strategy aimed at the problem of prepayment of Section 236 and Section 221(d)(3) mortgages is not a "property disposition" program in the customary sense. Under this $412 million component of the HOPE initiative, a three-pronged approach will be used to protect the residents who would be adversely affected by project prepayment. Part of the funds could be used to help tenant groups acquire and/or rehabilitate projects or for technical assistance and other purposes. Funding would also be used for voucher assistance as an inducement for owners to not prepay. Finally, if owners elect to prepay, vouchers would be available to tenants for use in the same project or elsewhere--at their choice.

DRUG ELIMINATION GRANTS

SENATOR MIKULSKI: What accounts for the fact that even those areas Bill Bennett says are the worst for drugs in the nation failed to get funding? Will future awards be more targeted to places like New York City or Baltimore?

ANSWER: The 1988 Anti-Drug Abuse Act created HUD's Public Housing Drug Elimination Grant Program. The statute requires that awards based on four criteria, including the extent of drug-related crime, the quality of the plan, the ability to carry out this plan, and the extent of local and community support. The law does not make provision for consideration of Regional distribution or city size. However, changes are being made to The Final Rule which will incorporate drug-related crime data in the Regional allocation formula.

Congress appropriated $8.2 million for fiscal year 1989 funding competition. HUD received approximately 500 applications and was able to fund only 37. In an intensive effort over a 6 week period, HUD staff members read and scored each application and funds were awarded on a competitive basis. These awards reflect the top-scoring applications for that competition. According to HUD, the vast majority of applications were of superior quality and certainly would have been funded had there been additional money available to distribute.

HUD plans to remedy this situation in the fiscal year 1990 competition when $97.4 million is available for awards. Because this is a demonstration program, information was gathered from PHAs/IHAs, the Field, and readers. As a result, we immediately took the following actions:

(1) Provided a toll-free 800 telephone line to review comments and debrief the applicants.

(2) Produced packets for PHAs/IHAs on grantsmanship skills.

(3) Produced packets for PHAs/IHAs on conducting assessments of drug-related crime.

(4) Developed plans to produce an application package to streamline the application process. This package will simplify the application requirements, and will provide forms for certifications.

As a result of our analysis, we are making the following changes in the Final Rule and Notice of Funding Availability (NOFA):

(1) A Regional assignment formula has been designed based on drug-related crime data. The formula will consider a Region's percentage of Public Housing units and its percentage of national drug violations. This formula will help ensure that the anti-drug money is directed toward those areas most in need of assistance based on drug-related crime violations.

(2) Selection criteria within statutory definition will be clarified to improve objectivity. The Final Rule/NOFA will include more breakouts for each of the selective ranking criteria. Each of the ranking criteria will be sub-divided into objective component parts with points awarded for each part. This will enable the applicants to fully understand how HUD will evaluate the proposals, and it will assist HUD's reviewers in making professional judgments during the scoring process.

(3) Increase weighing of crime/assessment data. The extent and assessment of drug-related crime will comprise nearly 40 percent of all points that can be awarded per application. Coupled with the Regional allocation formula, this modification will further help ensure that the need for HUD funding assistance, based on crime data, will be a major factor in the awarding of grants.

(4) Increase funding caps for larger PHAs/IHAs.

SENATOR MIKULSKI: How much will eliminating drugs in public housing cost? What about in privately owned, HUD-assisted housing?

ANSWER: No estimate exists for the cost of completely eliminating all drugs forever in public housing. Our 1991 Budget request for $150 million is, obviously, a step in that direction.

Currently, the House Committee (H.R. 1180) and Senate passed (S.566) Bills contain provisions which would expand the Public Housing Drug Elimination Pilot program to assisted housing. No estimate exists for the cost of eliminating drugs in privately owned, HUD-assisted housing either--although, presumably, the cost need not be borne entirely by the Federal Government.

DRUG ELIMINATION STRATEGY

SENATOR MIKULSKI: What is your strategy for ridding public housing of drugs?

ANSWER: Secretary Kemp has developed a "10 Point Plan" to fight drugs in Public and Indian Housing which incorporates enforcement, management and prevention efforts into a comprehensive plan to rid Public and Indian Housing of the drug scourge. Some of the anti-drug initiative goals are:

o **Establish the Office for Drug-Free Neighborhoods** The Secretary established the Office for Drug-Free Neighborhoods in the Office of General Counsel to develop, implement and coordinate HUD's anti-drug programs. These programs include: training, technical assistance, grants, special projects and the Drug Information and Strategy Clearinghouse. Resident Initiative Coordinators (RICs) have been selected in each Regional and Field Office to work on the anti-drug effort.

o **Streamline Evictions** A Notice of Termination of Public Housing Tenancy for Drug-Related Criminal Activity was published in the Federal Register on April 20, 1990. HUD has made a total of 40 determinations. The repeal of Section 404 allows HUD to resume efforts to streamline the eviction process while ensuring due process. HUD will continue its review of State eviction laws in order to make further determinations.

o **Termination of Section 8 Privileges for Drug Activity** A memorandum from the Secretary concerning HUD policy on drug-related and other serious criminal activity in Section 8 housing was sent to all Public Housing Agencies on April 28, 1990. Also, a proposed rule setting forth criteria for the terminating and denying of vouchers and certificates for those engaging in drug-related and other serious criminal activity was published in the Federal Register on October 26th, 1989. The final rule is pending OMB approval. Once regulatory changes are made, HUD will be in a much stronger position to assure that the Federal Government does not subsidize drug dealers.

o **Establish a Drug Information and Strategy Clearinghouse** The Drug Information and Strategy Clearinghouse has been established (1-800-245-2691). Databases made up of PHA, resident and community group anti-drug efforts, news reports and research are available for custom searches, and information packages are being developed on a continuing basis. Current projects include the "Home Front" newsletter, the development of a resource and drug strategy planning book called "Together We Can...Meet the Challenge."

- **Establish a Drug Training Program** The first national Resident Initiative Coordinators (RIC) Training Workshop was held July 24-28, 1989 featuring HUD staff and outside experts and subsequent training has taken place. Regional anti-drug conferences have taken place (e.g. Atlanta, Chicago and Boston). The HUD National Drug Training Unit is being developed to conduct national and regional training sessions and teleconferences for PHAs/IHAs, residents and community leaders.

- **Utilize Modernization and Other Grant Funds for Anti-Drug Efforts** A Notice outlining the eligible uses of Modernization funds for drug elimination activities was published in the Federal Register on April 4, 1990. This Notice has been updated and included in the new CIAP handbook. Eligible activities include: installing security hardware, making management improvements or hiring additional security guards. Applicable activities also will be covered in RIC and PHA/IHA training; likewise, PHAs/IHAs can be advised on eligible uses through the Clearinghouse and the drug resource guide.

  A Notice was published in the Federal Register on April 27, 1989 which outlined the eligible uses of Community Development Block Grant funds in support of drug abuse programs. Eligible activities include: increasing law enforcement services, and educational, counselling, recreational, and day-care programs.

- **Establish the Public Housing Drug Elimination Grant Program** A proposed rule for the Drug Elimination Pilot Program was published on June 21, 1989. For fiscal year 1989, Congress appropriated $8.2 million for the program. A Notice of Funding Availability (NOFA) was published on September 18, 1989 and funds were awarded in February, 1990. Funding for the grant program has been increased to $97.4 million for fiscal year 1990 and HUD has requested $149.8 million in grants for fiscal year 1991.

- **Provide Youth Program Opportunities in Public and Indian Housing** A Notice of Funding Availability was published on August 7, 1989 and 100 grants in the amount of $25,000 have been awarded to local governments seeking to provide constructive alternative activities for youth in Public and Indian Housing who are exposed to the plaque of drugs.

DRUG ELIMINATION IN PUBLIC HOUSING

SENATOR MIKULSKI: Given that HUD's housing portfolio has 3 million units that are privately owned, why haven't you developed a strategy, or requested funds, for eliminating drugs in these projects?

ANSWER: Drug abuse and trafficking affect much of America's low-income housing resources of which HUD-insured housing represents a significant portion. Drug use and sales as well as the accompanying decay and attendant criminal activity exacerbate maintenance and occupancy problems. These problems obviously have an extraordinarily negative impact on the financial viability of insured developments, placing the FHA Fund at potential risk for defaults and foreclosures.

HUD encourages owners to preserve low-income housing and is attempting to attract further private investment in this area. For this effort to be successful, low-income neighborhoods must be free from drugs. The private sector in several instances already has begun to address the drug problem in assisted housing in ways that are economically feasible and effective. We are currently exploring ways to enhance a public-private partnership in this area and will shortly be proposing legislation to assist in this effort.

SENATOR MIKULSKI: In making these recent awards, why was preference given to housing authorities with Resident Management Corporations when the 1988 drug bill does not list that as one of the criteria to be used?

ANSWER: Preference was not given to housing authorities with Resident Management Corporations (RMCs). Of the 37 awards made, 6 have a RMC involved in the anti-drug strategy; 14 have a Resident Council; 10 have a Resident Association or similar organization; and seven have various organized and other types of resident groups involved in their strategy. The criteria used did not require a RMC, but rather was designed to encourage the involvement of residents in PHA/IHA anti-drug plans.

SECTION 8 RENEWALS

SENATOR MIKULSKI: What accounts for the downward revision of your '91 budget number in both dollars and units for renewals from your August 2, 1989 letter to the Committee--better data, or a change in the assumptions HUD use to determine which renewals in the succeeding year (FY'92) need funds in 1991?

ANSWER: The renewal estimates in the 1991 Budget differ from the data provided to the Committee in late July as follows:

Contract Expirations
(Dollars in Millions)

	Units			Budget Authority		
Year	July Estimate	1991 Budget	Differ.	July Estimate	1991 Budget	Differ.
1991	332,716	294,495	-38,221	$8,755	$7,735	-$1,020
1992	250,101	250,389	+288	7,073	7,079	+6
1993	190,018	197,416	7,398	5,652	5,873	+221

The estimates provided earlier were based on the assumption that refunds would include the first quarter following the contract expiration date. The 1991 Budget estimates, on the other hand, assume funding through October of the following fiscal year for loan management and voucher expirations. For certificate contracts, funding included October and the first half of November of the following fiscal year. This is the same basis on which the 1990 Appropriation was based.

The per unit costs shown in the 1991 Budget also differ from the estimates provided to the Committee in that the budget data reflect updated economic assumptions.

SENATOR MIKULSKI: Who in HUD first recommended this change--people in the field, the Section 8 program office, the Assistant

Secretary for Housing or someone else--and before making this decision, with which specific housing authorities did you consult to see if this was a wise decision?

ANSWER: The initial set of options discussed with the Committee staff actually included a number of potential refunding plans which were under review. The plans varied in cost, reflecting options on the length of the renewal term and the timing of the renewals.

There are a variety of complex procedures which govern the administration of Section 8 contracts. The contracts which expire early--in the first month of a fiscal year--must be refunded in the previous year to ensure time is allowed for negotiation, processing and execution. In the case of loan management and voucher units, 1 month is the minimum time necessary.

The situation is more complicated for certificates because of the master contract approach used in administering the program. Under the master contract, as new certificates (increments) are provided to an administering agency, they are added by amending the single contract which contains all previously provided certificates.

At one point in time, it was thought that a 1-year lead would be needed for certificate refundings. This reflected our initial interpretation of the statutory requirement that all initial certificate leases must be for at least a 12-month period. We thought that all expiring increments, which are included in the master contracts, must be extended 1-year prior to expiration. After further investigation and review, the Department determined that full year in advance refunding of expiring certificates was not necessary and developed the "first quarter" proposal presented to the Committee in late July. After a closer look at the situation, it was decided that even a full quarter was unnecessary--45 days would actually be a sufficient lead time for certificates.

SENATOR MIKULSKI: Given the much larger number of renewals this year than last (about 700 percent more than FY 90), wouldn't it be easier administratively on HUD's field staff and on the housing authorities if you provided advance funds for the full first quarter of FY 92?

ANSWER: More money would, no doubt, make this easier for staff, but then the Congress would have to fund another $1.1 billion. Making things easier for staff is not necessarily the only funding determinant.

SENATOR MIKULSKI: When can we expect some major improvement in HUD's estimates on the actual cost and number of renewals?

ANSWER: Currently, we have a contractor analyzing the Assisted Housing accounting systems. We will not be able to determine the length of time required to make improvements until we receive the contractor's report. At that time, we will establish a time table for the improvements and will be better able to answer your question.

SENATOR MIKULSKI: Can you provide us with a list of the number of projects, and the units they encompass, whose owners will choose to "opt out" of Section 8, rather than renew, in FY 91 - 97? Please break that number out by year.

ANSWER: The Section 8 legislation requires the Section 8 project owner, 1 year before the Housing Assistance Contract is due to be extended, to give HUD and the Tenants 12 months notice that the 5-year renewal segment of the contract is up and that they do not intend to extend under their contract option. Based on the

Department's experience to date, owners normally exercise their option to extend the HAP contract. However, it is difficult to determine what project owners will or will not do in the future since the decision is solely in their hands and historical data just does not accurately reflect the future in these cases. As can be seen below, we have included a "straight-line" estimate of 1,000 Vouchers to be provided to eligible tenants in projects where the owner has decided to opt-out of the Section 8 program.

We will be able to refine our estimates as empirical data become available.

YEAR	UNITS	DOLLARS
1991	1,000	$29,125,000
1992	1,000	30,290,000
1993	1,000	31,410,730
1994	1,000	32,478,695
1995	1,000	33,485,534
1996	1,000	35,159,811
1997	1,000	36,917,802

SENATOR MIKULSKI: At last September's Subcommittee hearing, you guaranteed the Subcommittee that the Office of Assisted Housing would have HUD's Field Offices verify the '91 renewal numbers before the budget was submitted. Did this verification actually take place?

ANSWER: A verification process was begun, although not until after the Budget was submitted since information for verification did not become available until that time. Units and projects for certificates and loan management have come through the process and dollars are being looked at now.

SENATOR MIKULSKI: What is the Department's plan to "even out" the number of renewals which require funding each year and why did the "HOPE" initiative fail to include a proposal on this?

ANSWER: The Department is considering various methods to managing the expiration of Section 8 contracts. However, such an option would assume that data quality was sufficient to make decisions on evening out the expirations. The "HOPE" proposals were not designed to include the renewals process--which, in any event, does not require new legislation. Any initiative, in addition, on renewals, will, of course have to await the results of the independent contract review now underway.

SENATOR MIKULSKI: What is the Department's current best estimate of the number of certificates and vouchers which will expire in fiscal years 1991, 1992, 1993, 1994 and 1995? As there is a cost difference between vouchers, certificates and loan management set asides, please provide a breakout for the expiration of each type of assistance.

ANSWER: The attached table lists the estimated number of units to be funded by fiscal year and program type. Data is also included on the costs associated with the renewal of each program type. The per unit costs for Certificates differs from the costs for Vouchers and Loan Management as they based on actual disbursements rather than reservation accounting data.

1991 BUDGET ESTIMATES

FISCAL YEAR 1991

	Units	Per Unit Cost	Term	Budget Authority
Certificates (Oct./1/2Nov)..	136,490	$5,355	5	$3,654,519,750
Vouchers (Oct.).............	34,483	5,670	5	977,593,050
Loan Management (Oct.)......	123,522	5,024	5	3,103,027,043
Total.....................	294,495			7,735,139,843

FISCAL YEAR 1992

	Units	Per Unit Cost	Term	Budget Authority
Certificates (Oct./1/2Nov)..	135,328	$5,623	5	$3,804,746,720
Vouchers (Oct.).............	70,498	5,954	5	2,098,725,460
Loan Management (Oct.)......	44,563	5,275	5	1,175,349,125
Total.....................	250,389			7,078,821,305

FISCAL YEAR 1993

	Units	Per Unit Cost	Term	Budget Authority
Certificates (Oct./1/2Nov)..	113,551	$5,904	5	$3,352,025,520
Vouchers (Oct.).............	55,734	6,252	5	1,742,244,840
Loan Management (Oct.)......	28,131	5,539	5	779,088,045
Total.....................	197,416			5,873,358,405

FISCAL YEAR 1994

	Units	Per Unit Cost	Term	Budget Authority
Certificates (Oct./1/2Nov)..	108,037	$6,199	5	$3,348,606,815
Vouchers (Oct.).............	47,119	6,565	5	1,546,681,175
Loan Management (Oct.)......	18,245	5,816	5	530,564,600
Total.....................	173,401			5,425,852,590

FISCAL YEAR 1995

	Units	Per Unit Cost	Term	Budget Authority
Certificates (Oct./1/2Nov)..	77,898	$6,509	5	$2,535,190,410
Vouchers (Oct.).............	80,360	6,893	5	2,769,607,400
Loan Management (Oct.)......	23,829	6,107	5	727,618,515
Total.....................	182,087			6,032,416,325

HANDICAPPED ACCESSIBILITY GUIDELINES

Question: What is the status of your handicapped accessibility guidelines to fully implement the Fair Housing Act Amendments of 1988, and why has it taken so long to issue them?

Answer: The Department submitted the proposed fair housing accessibility guidelines to the Office of Management and Budget (OMB) in late January 1990. Subsequently, the Department has been working closely with OMB and the Department of Justice to resolve various issues that were identified.

The guidelines are currently in the final stages of the clearance process. The draft now being prepared for publication reflects comments received from the Department of Justice and OMB, as well as consideration of a number of detailed recommendations received from both housing industry representatives and advocacy groups for consumers with disabilities in response to the docket of public comments that was opened in August 1989. All of these comments, along with many received from interested professionals and people with disabilities, have been considered as the Department refined the proposed guidelines. In addition, the Department has been conducting cost studies to assist in evaluating the options and assessing the impact of alternative approaches.

Question: When can we expect them to be issued in final form so that the private sector has some sense of certainty as to the requirements of the Act?

Answer: Publication of the proposed guidelines will be a major step in relieving uncertainty about the Department's interpretation of the requirements that are specified in the law and the regulations. The publication date for the final guidelines will be determined in some degree by the extent and range of public comments that are received. The Department is committed to completing the development of final guidelines on an accelerated schedule.

Question: Is HUD or the Administration planning to submit any legislation on the Fair Housing issue because of the delay in issuing these accessibility guidelines?

Answer: No requests for legislative action are anticipated. The effective date of the law was not contingent upon publication of the guidelines. The Department provided interpretation in its earlier rulemaking effort on some of the key issues related to adaptive features required in dwelling units. In addition, the statute provides that technical specifications of the American National Standards Institute (ANSI) standard may be applied to the design of the required features that are itemized in the law and the implementing regulations.

ELDERLY HOUSING ISSUES

SENATOR MIKULSKI: What were the number of units in the 202 pipeline backlog when you took office, and what is it today?

ANSWER: Data are not currently available on the pipeline of Section 202 projects as of the exact date this Administration took office. However, the table below shows the recent trend in pipeline activity as of the close of fiscal years 1988, 1989 and May 1990.

	Sept. 30 1988	Sept. 30 1989	May 31 1990
		(Number of Units)	
Reserved, not started.....	43,416	34,622	31,065
Started, not completed....	8,990	8,831	7,561
Total pipeline..........	52,406	43,453	38,646

SENATOR MIKULSKI: Since we have permitted the Depatment to reprogram $55 million more into 202 amendments than originally appropriated last year to help "unclog" the pipeline, does that mean the pipeline will be gone at the end of 1990?

ANSWER: The entire pipeline will not be eliminated by the end of 1990. HUD's goal is to get as many of the older projects as possible under construction--some will still remain due to problems beyond the realm of simply providing more money or increasing the Fair Markets Rents (FMRs). In addition, the unstarted/uncompleted pipeline will continue to be fed by new projects receiving reservations each year. As the table in the previous response indicates, more and more of the pipeline is beginning to move toward completion, but the end of 1990 is far too soon to expect total elimination of the backlog.

SENATOR MIKULSKI: Is the Department going to propose modifications to its current "cost containment" guidelines which are seen as a major reason for the pipeline backup?

ANSWER: No immediate changes with respect to cost containment are anticipated. Cost containment has not been a major problem for the pipeline. The major problems have been the capping of the FMRs and holding the older projects to the fiscal year 1986 rents. Those two things coupled with the 9 1/4 percent interest rate have created the need for large up-front cash requirements because the rents would not support the projected development cost. Authorization to use the current rents and the lower fiscal year 1990 interest rate are expected to be effective in helping to clear much of the backlog.

SENATOR MIKULSKI: Could you explain why you are proposing to kill the Congregate Services Program for 202 and public housing and projects and replace it with a highly similar tentant based program, despite a HUD report last fall that called it a "promising option" (p. viii) that should be farther developed and evaluated?

ANSWER: The Administration has not proposed termination of the CHSP. Rather, the Department is building on the experience of the CHSP. The Department has proposed, as part of its 1991 Budget, a new initiative under the HOPE program which would establish a demonstration project to provide service-supported housing for the frail elderly. The demonstration would couple housing vouchers with assistance to help pay for the services they would need in order to continue living independently. HUD will provide $34 million in housing voucher assistance and $10 million in supportive services funding. Both kinds of assistance will be for 5 years. Approximately 1,500 frail elderly individuals will be served under this demonstration. This approach to housing the elderly will be used to test whether services provided within a variety of alternative housing situations will prove more effective than the Congregate Housing Services program. However, it is imperative that we work to ensure effective coordination between HUD projects and HHS agencies.

It is apparent, from visiting with and talking to many service providers, particularly those in urban areas, that there are sufficient State and local resources available to provide for the supportive service needs of the frail elderly. The problem now (as in 1978 when the CHSP was initially funded), is that the linkage is inadequate between HUD, HHS and other agencies providing services.

Thus, in order to provide for the service needs of the 2,000 residents serviced by the CHSP and the needs of the other 1,500,000 elderly in Federally assisted housing, we are developing this initiative to focus on better targeting of the HHS supportive service funds to the frail elderly of HUD housing, while also providing HUD staff and project managers with the skills they need to deal with the aging in place phenomenon. We recognize that while it may be fairly easy to accomplish this with assistance from the Administration on Aging (AoA) and others in urban areas, we will have to work closely with the States to ensure there is no loss of needed services in rural projects.

Secretaries Kemp and Sullivan of HHS signed a Memorandum of Understanding (MOU) on January 24, 1990, in which they agreed to work together more closely to assure that services from HHS are better targeted to identified HUD client populations. A number of staff-level groups are currently working to insure that activities are developed to benefit those populations. Additionally, in order to better meet the needs of the elderly under the aegis of this MOU, the Department is working with AoA to achieve similar goals for our frail elderly and non-elderly handicaped populations. We expect to finalize an interagency agreement shortly with AoA in which we will jointly do the following:

1. Require our Field Offices and AoA-sponsored Aging network staff to work together to develop State and local level coordination agreements to ensure that a higher level of available resources is targeted to those frail elderly in Federally assisted housing. This will be a three-Region demonstation in fiscal year 1991, we hope to expand this program to all Regions in fiscal year 1992.

2. Provide training and technical assistance to HUD staff and project managers on services coordination and aging in place.

3. Develop a handbook of supportive services and services management for the 1990's, and an up-dated directory of HUD housing for the elderly and handicapped.

4. Develop a policy defining "frail elderly" for HUD allowing service coordinators as an eligible expense in HUD projects.

5. Hold a series of national and regional conferences on aging in place and the frail elderly in HUD projects.

6. Determine retrofitting needs and costs for HUD projects in the 1990's to meet the needs of the frail elderly.

7. Also, we hope to begin working with the National Institute of Mental Health and other agencies to expand these activities to address the needs of the chronically mentally ill population.

Thus, we believe these activities should go a long way to insure the improvement of services to the frail residents of HUD housing, and also, continuance of services to the CHSP grantees.

SENATOR MIKULSKI: Why is your new elderly demonstration program for only $10 million when support services for elderly HUD tenants, according to HUD's own report, could cost between $300 million and $800 million a year?

ANSWER: The concept of a voucher combining housing and services, or of a services voucher alone, has not been tried previously, let alone tested. The demonstration must be small so that a few housing authorities (PHAs) in a number of varying localities (e.g., metro/non-metro) can be funded, and the concept carefully tested.

We are not sure the degree to which the PHAs will be able to effectively coordinate services in the varying local environments extant under this proposed legislation, nor the degree to which the States and localities will take part. We want to work with them and learn from both the PHAs and the States/localities/service providers as they use the concept. Only if we proceed carefully, can we be assured that this component of the HOPE proposal will be effectively implemented.

SENATOR MIKULSKI: Why are you proposing a new Elderly Voucher program, while at the same time cutting elderly housing new construction? Aren't senior citizens the last people we want to be forced to search all over their community for housing?

ANSWER: As you know, we have recommended a smaller new construction program, as the costs are quite high and some areas of the country have an over-concentration of projects designed for the elderly.

However, the services supported voucher demonstration proposal is carefully targeted to only a small subset of the elderly--those elderly in the general community who need services in addition to housing in order to remain independent and at home. The advantage of the HOPE proposal is that it will allow elderly who qualify for the voucher to remain in their current apartment if it meets the Section 8 Quality Standards. Thus, an elderly prson, who wants services and lives in substandard (or nearly so) housing, will move, by choice, to an apartment which meets safety and other appropriate building codes. There is no intent within this proposal to force anyone to move anywhere.

SECTION 8 AMENDMENTS

SENATOR MIKULSKI: What is the status of HUD's "amendment" study, which the Committee requested in last year's report, and is now about two months late? When will we get it?

ANSWER: An extension of the March 17, 1990 deadline established in the Senate Report to the 1990 Appropriations Act was requested by the Department in a letter dated April 10, 1990. The letter asked for an extension to August 31, 1990.

SENATOR MIKULSKI: Why is this amount going up so much and what are you going to do in 1991 to get these costs under control?

ANSWER: The need for amendment funds for the Certificate program is increasing because there is a large number of certificates (approximately 700,000) that were committed under ACCs from 1975 to 1983. These Certificates have now been providing assistance for families for periods of 7-to-15 years, depending on the year of approval. They are intended to provide assistance for 15 years. However, the funding that was budgeted appropriated, and reserved for these Certificates was insufficient from the outset for the intended 15-year term.

Funding was insufficient because the amount reserved for each Certificate was calculated by multiplying the initial year's funding (based on the fair market rent in effect in the year of approval) by 15 years. The funding approach did not account for rent inflation over 15 years which has caused the need for substantial amendments in order to maintain the number of approved Certificates for 15 years as intended.

The Department has always recognized that, due to expected but indeterminable rent inflation over the 15-year assistance period, contract amendments would be required in later years to increase funding authority. It would not have been practical to try to accurately set funding to reflect actual costs of rent assistance over 15 years, since the rate of inflation through the 1970s and early 1980s was very unpredictable.

The need for amendment funding is not expected to be a problem for Certificates that were funded in fiscal years 1989 and 1990, since these Certificates are intended to provide assistance for only 5 years. Program experience has demonstrated that the Department's funding approach sustains Program operations for 5 years without the need for supplemental funds.

SENATOR MIKULSKI: What were the most significant points from the Inspector General's recent survey of PHA's on the West Coast? Was there a high error rate?

ANSWER: The Inspector General's Report affirmed that there are serious deficiencies in the Section 8 accounting and budgeting systems. As a result, HUD does not have reliable data for providing accurate estimates to Congress of the amount of amendment funding which will be needed for projects experiencing shortfalls or the amount of funding needed for replacing expiring contracts.

The Report emphasized that HUD does not have a long-range plan for combining the best features of the Section 8 certificate and housing voucher programs and until this issue is resolved between Congress and the Administration, HUD management cannot effectively plan or budget for the Section 8 contracts which are scheduled to expire over the next 10 years. As you know, HUD's current plan is to replace expiring Section 8 Certificates and Housing Vouchers on a one-for-one in-kind basis. The two programs cost essentially the same so any future combining of the programs will not have a significant budgetary or long range planning impact.

The Inspector General study found that HUD's system for requesting amendment funds for the Section 8 Certificate and Moderate Rehabilitation programs is generally sound, but requires improved data quality control. Also, the SURVEY enhancement to account for individual funding increment expirations and to determine budget authority shortfalls should be implemented. The Department is revising SURVEY to make these improvements. The IG study did not identify a high--or significant--error rate.

BUDGETED REDUCTION IN AVERAGE COST PER STAFF-YEAR

SENATOR MIKULSKI: Why does the budget include a "budgeted reduction" of $11.4 million in the average cost per staff-year? Doesn't this cut directly contradict the comments of Mr. Traxler and myself when we approved your 1990 operating plan? If this item remains in the agency's 1991 budget, how many of the new staff-years you are requesting in the budget would be lost?

ANSWER: The Department's budgets have typically reflected a "budgeted reduction" in average staff-year costs as part of an effort to hold down staff-year costs. Usually, this has not presented a problem, for the Department has been able to live within the amounts appropriated and the staffing levels approved by the Congress. To the extent any problem occurred, it was always possible to absorb the costs through lapses, hiring temporary rather than permanent employees, or using balances of "other objects." During the past year, however, there was a serious problem because reductions in the Appropriation Act and the sequestration under Gramm-Rudman-Hollings eliminated the flexibility that had been available to the Department in previous years. In 1990, there was little flexibility within the funds available to the Department to manage higher staff-year costs.

In 1991, the Department would be able to achieve the staffing levels available in the Budget if the amounts are appropriated as requested. However, if fund reductions and sequestrations occur as in 1990, there is no assurance that the requested staffing levels could be attained. If that were the case, the effect of the "budgeted reduction" in average staff-year costs should be the equivalent of around 270 staff-years.

1991 STAFFING REQUEST TO OMB

SENATOR MIKULSKI: Please provide a breakout of your staffing request to OMB for 1990, how it compares to the 1990 appropriation, your September 1 submission to OMB for 1991, and your 1991 budget request. Did you appeal any of the 1991 OMB cuts? Which ones?

ANSWER: The requested staffing data for 1990 and 1991 are attached.

The Department did not appeal any staff-years for 1991. The 1991 Budget estimate of 14,217.8 staff-years, including the Working Capital Fund and the Office of Inspector General, is 177.0 staff-years less than our request to OMB in September 1989.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

1990 AND 1991 STAFF-YEAR REQUESTS
(INCLUDES TERMINAL LEAVE)

	FY 1990			FY 1991		
	OMB Request	Appropriation a/	Approp. vs. Request	OMB Request b/	Budget Estimate	Budget vs. Request
Housing Programs:						
Headquarters	956.4	983.4	27.0	1,117.0	1,117.0	0.0
Field	6,021.9	5,592.3	(429.6)	5,918.2	5,918.2	0.0
Total	6,978.3	6,575.7	(402.6)	7,035.2	7,035.2	0.0
Public and Indian Housing:						
Headquarters	145.2	149.7	4.5	155.2	148.2	(7.0)
Field	1,150.2	1,200.1	49.9	1,244.0	1,219.0	(25.0)
Total	1,295.4	1,349.8	54.4	1,399.2	1,367.2	(32.0)
Government National Mortgage Assn:						
Headquarters	61.1	59.9	(1.2)	61.1	61.1	0.0
Community Planning and Development:						
Headquarters	278.7	280.0	1.3	287.8	270.8	(17.0)
Field	904.1	826.0	(78.1)	956.2	861.2	(95.0)
Total	1,182.8	1,106.0	(76.8)	1,244.0	1,132.0	(112.0)
Policy Development and Research						
Headquarters	148.1	137.4	(10.7)	155.1	147.1	(8.0)
Fair Housing and Equal Opportunity:						
Headquarters	177.4	156.9	(20.5)	169.6	169.6	0.0
Field	620.1	538.6	(81.5)	592.2	592.2	0.0
Total	797.5	695.5	(102.0)	761.8	761.8	0.0
Departmental Management:						
Headquarters	153.1	131.1	(22.0)	153.7	148.7	(5.0)
Office of General Counsel:						
Headquarters	283.3	237.9	(45.4)	271.0	271.0	0.0
Field Legal Services:						
Field	298.9	277.4	(21.5)	299.3	299.3	0.0
Administration:						
Headquarters:						
Admin. and Staff Services (S&E)	785.7	764.9	(20.8)	727.1	707.1	(20.0)
Working Capital Fund	283.8	283.8	0.0	283.8	283.8	0.0
Total	1,069.5	1,048.7	(20.8)	1,010.9	990.9	(20.0)
Field Direction and Operational Support:						
Field	533.0	494.1	(38.9)	533.5	533.5	0.0
Field Administration:						
Field	877.4	884.1	6.7	919.6	919.6	0.0
Subtotal	13,678.4	12,997.6	(680.8)	13,844.4	13,667.4	(177.0)

	FY 1990			FY 1991		
	OMB Request	Appropriation a/	Approp. vs. Request	OMB Request b/	Budget Estimate	Budget vs. Request
Office of Inspector General:						
Headquarters..........................	120.6	104.8	(15.8)	132.2	119.3	(12.9)
Field................................	397.9	390.4	(7.5)	418.2	431.1	12.9
Total............................	518.5	495.2	(23.3)	550.4	550.4	0.0
Total Staff-Years........................	14,196.9	13,492.8	(704.1)	14,394.8	14,217.8	(177.0)

a/ The FY 1990 Appropriation column reflects Congressional reductions (Section 517 and Sequestration), as well as reductions required to support higher personal services and adjustments for functional realignments.

b/ The FY 1991 OMB request column is 1.0 staff-years higher than the request submitted in September 1989 to adjust for rounding.

Note: All columns reflect the following functional realignments on a comparable basis:

-- Mortgage Insurance Accounting activities transferred from Office of Administration to Housing during 1990 (354.0 staff-years). 1991 columns reflect 459.4 staff-years transferred for the full year;

-- Program Compliance shift from Housing Field to Housing Headquarters of 60.0 staff-years in 1990 and 100.0 staff-years in 1991;

-- Homeless programs consolidation from Housing to Community Planning and Development;

-- Office of Drug-Free Neighborhoods establishment within the Office of General Counsel. Staff-years shifted from Housing, Public and Indian Housing, Community Planning and Development, Fair Housing and Equal Opportunity, Departmental Management and Administration; and

-- International Affairs function shifted from Departmental Management to the Office of Policy Development and Research (2.9 staff-years).

Highest Priority Staffing Needs

SENATOR MIKULSKI: Could you rank which offices within HUD--Housing, Community Planning and Development or somewhere else--which rank as the highest priority in staffing needs?

ANSWER: The priorities of this Administration for staffing within HUD are reflected in the Budget.

Status of Chief Financial Officer

SENATOR MIKULSKI: What is the status of the establishment of HUD's Chief Financial Officer (CFO), approved as part of last year's Reform Act?

ANSWER: As part of the Reform Act, the Department contracted with the National Academy for Public Administration to study the Department's financial management systems and design a CFO position which would meet the Department's financial management needs. The CFO position was established in January 1990. This was followed by nationwide recruitment efforts in January and February to attract top-quality candidates for this position. Three hundred and three (303) applications were received and, after several screening steps, six candidates emerged for final consideration. A Blue Ribbon Panel of top financial experts was assembled to interview the six candidates. From that process, the top two candidates were further interviewed by the Secretary and Under Secretary. After much deliberation, it was decided that no one candidate possessed all of the qualities and skills that the Secretary was seeking. As a result, the position vacancy announcement was cancelled, and a new, more targeted search is being done to identify potential pools of candidates before readvertising the position.

In the interim, the Secretary is requesting OPM's approval to fill the CFO position on a temporary basis to begin office operations and put into place some critical aspects of the financial management program.

Office of Chief Financial Officer - Functions and Staffing

SENATOR MIKULSKI: What functions will be included in the CFO's office, what is the estimated staffing need for it, and from where will that staff come?

ANSWER: The main functions of the Office of the Chief Financial Officer include:

- -- financial management policy and standards;
- -- financial management evaluation and analysis; and
- -- financial management systems development and modification planning.

The National Academy for Public Administration (NAPA) report recommends a relatively small oversight office, responsible for the coordination of accounting and other financial operations throughout the Department, and ensuring that systems are capable of meeting the financial needs of program managers. The NAPA report recommends initial staffing of 27 positions for the Office. These would be functional realignments within the Department, primarily impacting the Office of Finance and Accounting, as well as Housing, the Office of Information Policies and Systems and the Office of Management and Quality Assurance.

The report further recommends that an additional 13 positions be provided to the CFO beginning in 1991. These positions would have to be reprogrammed from other offices in the Department. Finally, the NAPA report recommends that Office of Budget functions be transferred to the Office of the CFO 6 months after establishment of that Office.

It is the Department's intent to absorb all staffing requirements for the Office of the CFO, either by realigning responsibilities within the Department or by the reprogramming of staff.

PUBLIC AND INDIAN HOUSING MODERNIZATION BACKLOG

SENATOR MIKULSKI: In what year does the Administration plan to have the Public Housing modernization backlog eliminated? At the current year's request, won't it take until well into the 21st Century? Shouldn't we do better?

ANSWER: The mandatory modernization backlog currently is estimated to be $13.36 million. This includes:

- o repairs and replacement needs which arise because of aging of projects and are due to normal wear and tear;

- extraordinary repair needs which are unpredictable and not related to building age;

- lead based paint testing and abatement; and

- handicapped accessibility needs.

In addition, there is a backlog of $5.89 billion (in 1990 dollars) for project-specific additions for such items as washer-dryer hookups, which, while not necessary to meet the criteria for decent, safe, and sanitary housing, improve project desirability, marketability, and long-range viability.

There is a third category of energy redesign needs, totalling $2.39 billion which would ensure the long-term viability and marketability of a project.

Finally, there is a backlog of $6.39 billion of residual needs which were not rated as necessary by inspectors or are currently not permitted by HUD, but which would improve project liveability.

If all these backlog needs are considered, the total estimated backlog would be $22.3 billion.

The development of an estimate of how long it would take to reduce this backlog is complicated because the existing backlog estimate was calculated prior to the imposition of the current requirements for lead-based paint removal and accessibility for the handicapped, and therefore more extensive funding may be needed for these work items. These two requirements alone may add a significant amount to the backlog.

OPERATING SUBSIDIES SHORTFALL

SENATOR MIKULSKI: Why are you proposing $150 million for drug eradication, when the shortfall for operating subsidies between FY 90 and 91, which go for drug-related things like security, is $250 million?

ANSWER: Based on the Department's latest operation cost data, it is estimated that the $1,865 million appropriated for 1990 (including the $72 million made available under the 1990 Dire Emergency Supplemental Appropriation Act) will be $50.5 million below total requirements. For the most part, this shortfall is not attributable to drug enforcement requirements. Higher utility cost were responsible for virtually all of the increase in requirements.

The $150 million being requested for drug elimination endeavors in 1991 is consistent with the $106.6 million expected to be obligated for such activities in 1990. This is a new program area and the Department should be reasonably certain of the effectiveness of its drug elimination efforts before requesting higher funding levels.

OPERATING SUBSIDY APPROPRIATION

SENATOR MIKULSKI: Why can't HUD come up with an appropriation that reflects the real cost of what it takes to fund operating subsidies? Is it an OMB-driven problem or one related to your own internal estimating?

ANSWER: Two main factors affect the accuracy of HUD's estimates. One is the need to forecast inflation for utilities, other costs, and income 2 years into the future. If each of these three elements are underestimated by just 1 percent, the impact is $11 million, $28 million, and $21 million, respectively, for a total underestimate of $60 million. The Office of Management and Budget (OMB) provides a set of economic assumptions which is used by all agencies in the development of budget estimates. The dramatic increase in oil prices in December 1989 increased operating subsidy requirements by $49.2 million. In the case of Operating Subsidies utilities, specific economic assumptions for utility costs are used. These are based on forecasts developed by the Energy Information Administration, an independent statistical agency within the Department of Energy. Even though these forecasts have generally been very accurate, no one could foresee that an unusually cold December would have such a dramatic effect on local market oil prices. The second factor is the impact or timing of proposed legislation and regulatory changes. A Budget prepared 2 years in advance may include proposals that are never implemented or are implemented in a later fiscal year. The estimate also does not include unanticipated legislated changes to the Performance Funding System.

Community Development Programs

SENATOR MIKULSKI: Why are you proposing a cut of 5 percent in the CDBG program at the same time you indicate a need for increased use of block grant funds for such things as urban homesteading?

ANSWER: The proposed reduction in 1991 funding for CDBG reflects the policy decision to eliminate set asides for two funding categories -- Special Projects and Technical Assistance--which were funded in 1990 under the formerly authorized Secretary's Discretionary Fund. The HUD Reform Act eliminated the Special Projects category and the Department believes direct funding of Technical Assistance is not necessary. Also, the 1991 Budget reflects a policy decision to increase funding support for the disadvantaged in other priority areas, consistent with Departmental goals of providing additional assistance to the homeless and expanding homeownership and affordable housing opportunities.

COMMUNITY DEVELOPMENT PROGRAMS
(Section 312 Loans)

SENATOR MIKULSKI: Why are you proposing to double the size of the Urban Homesteading program, but eliminate the 312 program, a source of 46 percent of the homesteaders' repair funds?

ANSWER: The Urban Homesteading program is proposed for a substantial increase to reflect the Administration's priority to promote increased homeownership opportunities for lower-income families. The funding level proposed for fiscal year 1991 reflects the tremendous unmet demand for homesteading assistance by both existing program participants and many communities and States that have been effectively shut out of the program due to lack of program funds. Also, the addition of the Resolution Trust Corporation to the list of agencies from which homestead properties may be purchased and the increase in the number of properties held by FHA have greatly expanded the single family property resources available for homesteading. Concerning rehabilitation financing, we believe that the Section 312 program is an inefficient way to deliver rehabilitation funds. Local governments have increasingly used other funds (CDBG or private) to finance the repair of homesteading properties. In light of the fact that about one-third of the CDBG funds are used in local rehabilitation programs, we believe the resources are sufficient to adequately assist homesteaders.

Rental Rehabilitation Grants

SENATOR MIKULSKI: Why are you proposing to cut the rental rehabilitation grant program by 40 percent, while at the same time saying that this program is a means to ensure that holders of the vouchers you push so strongly will have a place to use them?

ANSWER: The Rental Rehabilitation program has had some success, but it is currently being re-evaluated to ensure that it is effectively meeting the needs of low-income families.

However, The $70 million being requested for fiscal year 1991 will enable a significant level of rehabilitation to be initiated under the program. Also, States and cities use other flexible resources, both Federal and non-Federal, to undertake additional rehabilitation using the Rental Rehabilitation program design.

Section 108 Loan Guarantee Program

SENATOR MIKULSKI: Why are you proposing to terminate the section 108 loan guarantee program, when it seems to be a low cost way to realize the objectives of the block grant program?

ANSWER: We realize that the Section 108 program has been somewhat effective in meeting community and economic development needs in some cases. However, we believe this is outweighed by the need to reduce undue pressure on the markets by Federal credit programs.

SENATOR MIKULSKI: What has the loan guarantee program cost the federal government over the years?

ANSWER: The direct costs to the Federal Government for this program have been minimal since there has never been a default under any guaranteed loan.

OPERATION BOOTSTRAP

SENATOR MIKULSKI: HUD's Budget proposes that PHAs may not issue any certificate or voucher in FY 91 to a welfare family applicant unless the PHA assures that the applicant "will have access to a comprehensive program which combines housing assistance with supportive services such as job training and child care." The certificate or voucher must be combined "with a local program to help them escape from dependency." (HUD Budget FY 91, page I-3)

How are PHAs to provide or obtain these services for the 85,000 or so new certificate/voucher applicants - to say nothing of the renewals? Is this another high-sounding proposal with no resources proposed? You already have PHAs $122 million short for FY 90 and we are told, $300 million short in your FY 91 operating subsidy request.

ANSWER: The Operation Bootstrap Program does not involve PHA provided services, and funds for services are not included in the HUD Budget. Instead, it combines the Section 8 housing resources with other services for low-income individuals to enable them to move from dependence to social and economic self-sufficiency. Services such as job skills assessment, job training, job placement, child care, transportation, counseling and education are provided by a variety of local nonprofit, business, and public service entities. HUD's legislative proposal for Operation Bootstrap provides for a deferral of family participation until a slot becomes available when the community's capacity to provide services is reached.

Experience with Operation Bootstrap during fiscal year 1989 indicates that PHAs are very interested in developing local programs. Despite a short application deadline, 287 PHAs applied for 27,000 units in response to a Notice of Fund Availability for approximately 3,000 units.

SENATOR MIKULSKI: If a PHA does not have the dollars to provide these services, will they fail to receive an allocation for certificates or vouchers in FY 91?

ANSWER: As detailed above, it is not the PHA's responsibility to provide the services.

DEMONSTRATION OF COMPREHENSIVE SERVICES

SENATOR MIKULSKI: Section 126 of the Housing and Community Development Act of 1987 (Pub. L. 100-242, Feb. 7, 1988) directed HUD to carry out a 5-year demonstration program for the provision of comprehensive services to public housing residents which would ensure their successful transition to private housing. The demonstration required HUD consultation with other appropriate Federal agencies.

The Charlotte, North Carolina PHA was required to "ensure the provision of remediation services" to participating families. Among the services which the PHA may provide under the demonstration are remedial education, services leading to the completion of high school, job training and preparation, drug treatment and counseling, homemaking skills and parenting and training in money management.

An interim report to Congress on the demonstration was required 2 years after enactment (Feb. 1990).

Before embarking on the expansion of this concept through Operation Bootstrap, what are the results of the Charlotte demonstration? What, if any regulations have you issued for the implementation of the demonstration which would be useful in Operation Bootstrap?

ANSWER: The expansion of comprehensive assistance through Operation Bootstrap is not based on the Charlotte, North Carolina model, but is based on the highly successful "Project Self-Sufficiency," a 4-year demonstration conducted by HUD's Office of Policy Development and Research. The Department is in the process of examining the demonstration program in Charlotte. This examination will result in an interim report to Congress in the 1st quarter of fiscal year 1991. The Charlotte Project was implemented on a demonstration basis not requiring regulations.

SENATOR MIKULSKI: How many public housing units nationwide will require some sort of lead abatement and where is the largest concentration of them?

ANSWER: Based upon a 1986 report prepared for HUD entitled The Cost of Lead Based Paint Abatement in Public Housing, the magnitude of the problem of lead-based paint in public housing (family units at or above one milligram per square centimeter, the statutory action level) is as follows:

Construction year	Number
pre 1950..................	95,731
1951-59....................	148,011
1960-77....................	169,426
Total.................	413,168

These estimates may be high for two reasons: some abatement has taken place since this survey; and, we believe that the X-ray fluorescence instrument used in this survey had a bias which tended to reflect a somewhat higher lead content than that which actually existed. HUD's national survey of lead-based paint hazards currently underway, should help to refine these estimates.

As to the location of these concentrations, because there is a significantly higher incidence of lead in units constructed prior to 1950, we expect the older central cities, particularly in the Northeast and Midwest, to possess larger numbers of public housing units requiring abatement.

LEAD-BASED PAINT

SENATOR MIKULSKI: How much will it cost to abate these units and why are there no funds in the '91 Budget to do this? Did you ask OMB for any funds?

ANSWER: At this time, the Department does not know what the cost will be to abate lead-based paint in Public and Indian Housing. Since the cost is not yet known, funds for this purpose were not requested specifically in the 1991 Budget submitted to the Office of Management and Budget (OMB) or the Congress. However, the cost of abatement will be an eligible Modernization program expense.

SENATOR MIKULSKI: What about the same data -- number of units, concentration, and cost -- for lead paint abatement in Federally assisted, but privately owned housing?

ANSWER: The information on units affected by lead paint, and their concentration, will be provided in the Comprehensive and Workable Plan for privately owned housing to be submitted to Congress by September 6, 1990. However, the cost data must wait until the completion of the FHA demonstration, and this information may not be ready by September.

SENATOR MIKULSKI: Do you know how many reported cases of lead paint ingestion occurred in Public or Federally assisted housing over the last 5 years? What about for FY 89?

ANSWER: The Department does not know how many cases of lead paint ingestion occurred in Public and Indian Housing or Federally assisted housing over the last 5 years, including fiscal year 1989, because such cases are not required to be reported to HUD.

SENATOR MIKULSKI: Have you asked Health and Human Services Secretary Sullivan on the cost to Medicaid from treating lead paint ingestion from cases in public or Federally assisted housing over the last 5 years? Could you do so and get us a cost breakout by year, for the record?

ANSWER: HUD has not requested this information formally from Health and Human Services Secretary Sullivan. However, we are working closely with the Centers for Disease Control (CDC) on all the health aspects of lead-based paint poisoning and treatment. CDC tells us that this information is not available because of the way records of Medicaid expenditures are kept.

SENATOR MIKULSKI: What is your strategy to deal with lead paint abatement? Do you expect housing authorities, who have already been shortchanged in the operating subsidy by $122 million in FY 90, to pick up the tab?

ANSWER: Prior to and during fiscal year 1990, Public Housing Agencies (PHAs) and Indian Housing Authorities (IHAs) were instructed to conduct Lead-Based Paint (LBP) testing and abatement under the Comprehensive Improvement Assistance Program (CIAP). In fiscal year 1991 and subsequent fiscal years, a separate modernization funding category (LBP modernization) will be available from Modernization funds provided to PHAs/IHAs for projects that have been modernized in a previous fiscal year, but where LBP was not addressed, or where there are no other physical needs within the project other than LBP testing and/or abatement. The Department does not expect PHAs/IHAs to use their operating subsidies to "pick-up the tab" for lead paint testing and abatement. However, a PHA/IHA may use its operating reserves or Modernization funds to address LBP requirements.

SENATOR MIKULSKI: When will you have a strategic action plan on this subject, beyond research and "demonstration" projects, ready for review by this Committee?

ANSWER: The Department will prepare a Comprehensive and Workable Plan for Public Housing once the Public Housing Abatement Demonstration is completed and the findings have been analyzed. The Public Housing Demonstration is finally getting underway after legislation was enacted to indemnify public housing agency participation. Because of the delay, the demonstration will not be completed until late this year. The Comprehensive and Workable Plan for Public Housing will be completed in June 1991 and will contain the "strategic action plan" which you have referenced.

SENATOR MIKULSKI: When do you plan to have lead paint exposure fully abated in Public Housing and what are the major milestones, and due dates for those milestones, between now and then?

ANSWER: PHAs/IHAs are required to randomly test all of their pre-1978 family projects by 1994. When LBP hazards are identified, PHAs/IHAs are required to abate those hazards. Future funding of the Modernization program will govern the Department's ability to fund testing and abatement of LBP in Public and Indian Housing.

The Department's first major milestone was the April 18, 1990 publication of the Interim Guidelines for the Identification and Abatement of Lead-Based Paint in Public and Indian Housing. The establishment of additional milestones is subject to the availability of future funding.

SENATOR MIKULSKI: Will you promise the Committee that in your 1992 budget submission to OMB that you'll make a major request for lead abatement funds?

ANSWER: We will shortly be in the process of developing our 1992 budget proposals. Lead paint abatement will certainly be a priority consideration during that process.

SENATOR MIKULSKI: A recent report by Dr. Ellen Silbergeld (a Baltimorean from the Senator's former district) and others of the Environmental Defense Fund states that "...lead today pervades America's environment. The result is a nationwide epidemic that is permanent neurologic damage to millions of American children." Leaders in the field of treatment of these lead-injured children are Julian Chisholm, M.D. and Mark Farfel, Sc.D. of the Kennedy Institute, an affiliate of John Hopkins University in Baltimore.

We are aware that HUD is issuing Guidelines for the testing and abatement of lead-paint, effective April 1 for public housing but readily applicable to all assisted housing. Since public housing is well-launched in removing lead-based paints - and is less than 2% of abatement policies relative to its non-public housing.

Do you plan to make these HUD Guidelines applicable: to property owned by HUD that is held in its inventory; to privately owned-but HUD subsidized property, such as 236s, 221d(3)s and new construction section 8s; to properties housing families assisted by certificates and vouchers; to FHA-foreclosed properties being sold to the public; to public housing or troubled FHA housing being sold to the tenants; to residential property that the Resolution Trust Corporation is selling?

ANSWER: The April 1 lead-based paint Guidelines currently apply only to HUD's public housing. The FHA and public housing abatement demonstrations, now underway, are being conducted to learn more about proper testing and abatement methods. The results will be used to modify the current Guidelines and the product will be applied to the above categories.

SENATOR MIKULSKI: With respect to each category, state when the Guidelines (or revised Guidelines) will be made applicable; if not, what lead-abatement requirements will be applicable to these categories of government-related residences? Why are the Guidelines not now being applied to all HUD-assisted housing?

ANSWER: The Department clearly intends to establish procedures to reduce as far as "practicable" the hazards of lead-based paint poisoning. The precise nature of these requirements will depend on the results of the research and demonstrations currently underway. The cost of abatement, who bears that cost, and whether it will cause a reduction in housing units available to families are issues which must be carefully considered before implementing any such procedures. The costs of abatement will likely require some type of priority setting system which identifies for abating those units which represent the greater risk to residents.

SENATOR MIKULSKI: Do you have any plans for aiding landlords of HUD-assisted housing in meeting the costs of lead abatement? Would section 312 rehabilitation loans be appropriate? Section 8 mod rehab? What do you plan to recommend?

SENATOR MILUKSKI: What plans do you have for funding the removal of lead contamination from HUD-owned residential property?

ANSWER: The issues raised by the above questions are currently being examined and will be addressed in the Comprehensive and Workable Plan for the Abatement of Privately Owned Housing which will be submitted to Congress by September 6, 1990. The issue of how an effort is financed (in short, who pays) is a critical one, particularly in light of the Federal budget deficit. The Department intends to identify equitable and practicable proposals for resolving this issue--including the role of the Federal Government--for the consideration of the Congress.

SENATOR MIKULSKI: An EPA official, writing in the 4/8/90 Washington Post, joins other experts in pointing up the dangers to children of lead in soil, yet your Guidelines provide no guidance or requirements for treating lead in soils. Why not? Won't it be wasteful for PHAs or others to do costly abatement to clean the interior of a unit only to have leaded soil traipsed in from the outside grounds? How does HUD plan to handle this issue?

ANSWER: The LBP Guidelines do not address the issue of lead in soil because the Department felt that it did not have the knowledge or expertise to provide short or long-term guidance for the treatment of lead in soil.

The Environmental Protection Agency (EPA) currently is conducting a research and demonstration program to address the issues of estimating and controlling the potential hazard of lead in soil. When this research and demonstration is completed, and recommendations and guidance are provided by EPA, HUD will update the LBP Guidelines accordingly.

The Interim LBP Guidelines provide a sample resident educational flyer and a Notice to Occupants of Clearance After a Lead Paint Abatement Project. This material informs residents of the hazards of lead paint and dust or soil which may contain lead. It also explains the steps they should take to reduce exposures.

SENATOR MIKULSKI: HUD insisted on both issuing and making its Guidelines effective on April 1 whereas our Committee felt it would be wiser to delay the efective date for 60 days to enable HUD to train its staff and other participants and to enable the PHAs to receive and review the Guidelines. When did all of the PHAs actually receive the Guidelines?

ANSWER: PHAs/IHAs that subscribe to the Federal Register received a copy of the April 18, 1990 issue which contained the Guidelines within a few days after publication. Reprints of the Guidelines are being sent to PHAs/IHAs that request a copy. Also, some of the Field Offices have reproduced the Federal Register version of the Guidelines and sent copies to the PHAs/IHAs in their jurisdictions. Additionally, the National Association of Housing and Redevelopment Officials (NAHRO) and the National Institute of Building Science (NIBS) have provided copies of the Guidelines to both their members and others. The Department also plans to have additional copies made available.

SENATOR MIKULSKI: What training materials have been published and distributed to HUD national office and field office staff regarding the Guidelines and their applicability to PHAs involved in the mod program? Where, when and by whom has the Department conducted training sessions for: (a) its staff; (b) PHAs; (c) private contractors, architects, engineers and the like who are apt to be doing mod and abatement work?

ANSWER: A complete General LBP Guideline Training package was developed by the Environmental Protection Agency (EPA) and delivered to HUD on April 3, 1990. As of May 25, 1990, 72 HUD Field Office Engineers and Housing Management Specialists received training on the LBP Guidelines. An outside instructor was hired to assist Headquarters staff in providing the training which was conducted at HUD's Training Center in Arlington, Virginia.

In addition to the HUD training, NAHRO conducted its first training session for PHAs and contractors in Arlington, Virginia, during the last week in April 1990. The Council of Large Public Housing Authorities and the Public Housing Authority Director's

Association conducted training for PHA Executive Directors, their legal counsels and Commission Chairpersons in Arlington, Virginia, on May 8, 1990; in Atlanta, Georgia, on May 11, 1990; and in St. Louis, Missouri on May 15, 1990.

SENATOR MIKULSKI: Is it the Department's interpretation of the Lead-Based Paint Poisoning Prevention (LBPPP) Act that all PHAs are required to conduct lead testing of all units subject thereto? Must they also abate lead which the testing shows to exceed the permissible standard? By what dates do they have to accomplish this work?

ANSWER: No. The Department interprets the LBPPP Act, as amended, to mean that PHAs/IHAs are required to randomly test their pre-1978 family projects. They also abate lead which the testing shows to exceed the permissible standards. PHAs/IHAs are required to complete random testing of the pre-1978 family projects by December 1994. They also are required to abate LBP hazards when they have been identified.

SENATOR MIKULSKI: Do PHAs which now have ongoing mod projects have to re-test and abate pursuant to the new Guidelines? Do PHAs have to apply the Guidelines to previously modernized projects? What is the source of funding for the PHAs to do this testing and abatement? Where does a PHA not involved in a mod project get funding to do the testing required by the statute?

ANSWER: PHAs/IHAs do not have to re-test and abate pursuant to the new Guidelines. PHAs/IHAs do not have to apply the Guidelines to previously modernized projects. However, a PHA/IHA may confirm LBP test results from testing conducted prior to the issuance of the Guidelines. PHAs/IHAs with no physical rehabilitation needs other than LBP testing and abatement may use their operating funds, including their reserves, or apply for Modernization funds. In fiscal year 1991, however, PHAs/IHAs will be able to apply for Modernization funds specifically designated for LBP work as well as use their operating funds to perform the testing required by the statute.

SENATOR MIKULSKI: Has HUD issued any explanatory materials in conjunction with the Guidelines which details answers to these and other issues of their applicability? How are the PHAs (and HUD staff) supposed to know the regulatory effect of the Guidelines?

ANSWER: The Department has developed a set of initial questions and answers for PHAs/IHAs and Field Office staff. This document provides clarifications on specific programmatic issues as they relate to the Guidelines and Modernization. This document will be placed in Departmental clearance shortly and will be issued in the near future. Additionally, with the assistance of EPA, the Department is developing explanatory materials and aids entitled Guidelines-at-a-Glance and Contractors Guidelines-at-a-Glance. The Interim Guidelines specifically state statutory, regulatory and CIAP Handbook requirements.

SENATOR MIKULSKI: The Conference Report to our FY 90 Appropriations directed HUD to revise its previously issued June 6, 1988 regulations for lead abatement to reflect the significant changes made by the McKinney Homelessness Amendments Act of 1988. Why has the Department not done this? Is it refusing to do so? If not, when will it issue a proposed rule complying with our instructions?

ANSWER: The June 6, 1988 regulation currently is being updated to incorporate the changes made by the Stewart B. McKinney Homeless Amendments Act of 1988. The Department will be issuing an amended LBP regulation shortly.

SENATOR MIKULSKI: Will PHAs and their contractors, architects and engineers be able to obtain the required liability insurance coverage when they go to bid for mod work that is subject to the new Guidelines?

ANSWER: The majority of the individual general liability insurance policies currently in effect for PHAs/IHAs, contractors, architects and engineers exclude coverage for claims arising from the discharge, dispersal or release of lead-dust or particles into the environment. It is very doubtful that an individual PHA/IHA or a contractor (including architectural and engineering firms) hired to abate/remove lead-based paint would be successful in obtaining this limited pollution coverage from their current insurers at an affordable cost. The Department, through an agent PHA, recently issued an Invitation for Sealed Bids for the procurement of a master insurance policy that would be available to all PHA/IHAs as they enter into a contract for the testing or abatement/removal of lead-based paint. Coverage will extend to contractors, architects and engineers. It is expected that the private market will respond with a cost effective price. The cost of the insurance will be paid by each PHA/IHA from their Modernization funds. Coverage is scheduled to become effective September 1, 1990.

SENATOR MIKULSKI: We are advised that only the Housing Authority Risk Retention Group (HARRG) is prepared to issue insurance coverage that covers the housing authority, the contractor and the designers during mod work and that covers the PHA against lead-related claims at other times. Where will the PHAs obtain funds to pay for the risk assessment that HARRG requires? For the premium for the on-going coverage against lead claims? For the latter, will HUD adjust the PFS to reflect this new expense? If not, how can the PHAs pay for the coverage?

ANSWER: HARRG announced their program to PHAs on June 1, 1990. The Department had not received a copy of the coverage document as of June 6, 1990. The cost of the lead-related claims during modernization work will be paid by PHAs from their modernization funds. The insurance for other lead-related claims would be paid from each PHAs operating funds.

The cost of the insurance for on-going coverage also would be paid from each PHA's operating funds. On January 1, 1989, each PHA's Allowable Expense Level (AEL) for insurance was increased from $3.38 Per Unit Month (PUM) to $11.83 PUM. Therefore, at the present time, the Department does not plan to increase the AEL. Continuing insurance costs will need to be paid from PHA operating funds unless funds are appropriated specifically for such expenses.

SENATOR MIKULSKI: We realize that the Guidelines have just been issued, but PHAs and, in some jurisdictions such as Maryland, private owners have been abating. What is HUD's current assessment of the range of the overall costs of testing and abatement of lead-based paint from Public Housing?

ANSWER: The Department has not assessed the range of overall costs of testing and abatement of LBP in Public and Indian Housing since the LBP Guidelines were just published on April 18, 1990. These guidelines represent the first national compilation of technical protocols, practices, and procedures on testing, abatement, worker protection, clean-up, and disposal of LBP in any type of residential strucure. PHAs, including those in Maryland, have not had an opportunity to apply the Guidelines to the Public Housing units which are being modernized.

SENATOR MIKULSKI: Plainly, it will be many years before all of public housing is modernized with lead-based paint abated. Thus, Congress instructed HUD in the statute to develop an interim containment policy for PHAs to follow to reduce the hazards to children. What is the status of this interim work at HUD?

Such interim containment work would seem to include, at least, resident education, maintenance staff, lab tests for wipe samples, and the considerable cost of keeping paint intact (repainting). Will not this on-going preventive maintenance program result in increased operating expenses for the PHAs?

ANSWER: HUD has developed a first draft of an interim containment policy which is undergoing internal review. We have also requested technical assistance from EPA on this subject. The Department expects to put such a policy in place during calendar year 1991. While the implementation of such a program will result in increased operating expenses, we do not yet know the magnitude.

OPERATING SUBSIDIES FOR LEAD-BASED PAINT ABATEMENT

SENATOR MIKULSKI: Do you plan to adjust the Allowable Expense Level in the Performance Funding System to cover these costs? When and how will you do this?

ANSWER: The Department does not plan to increase the Allowable Expense Level to provide for the costs of interim containment.

SENATOR MIKULSKI: If you do not plan to make this increase, where do you expect the PHAs to get the necessary funds?

ANSWER: The Department expects that Public Housing Agencies (PHAs) and Indian Housing Authorities (IHAs) will be able to fund the costs of interim containment from PHA/IHA operating reserves to the extent that the expenses are strictly maintenance and from Modernization funds (e.g., Special Purpose Modernization) to the extent that it is necessary and appropriate. The Department's Policy on Interim Containment has not yet been completed. Funding sources will be addressed thoroughly before that policy is issued.

Attached also is a PD&R organizational chart including the names and titles of key officials through the Division Director level.

SENATOR MIKULSKI: PD&R's current list of priorities for further study, and the estimated costs of these various studies.

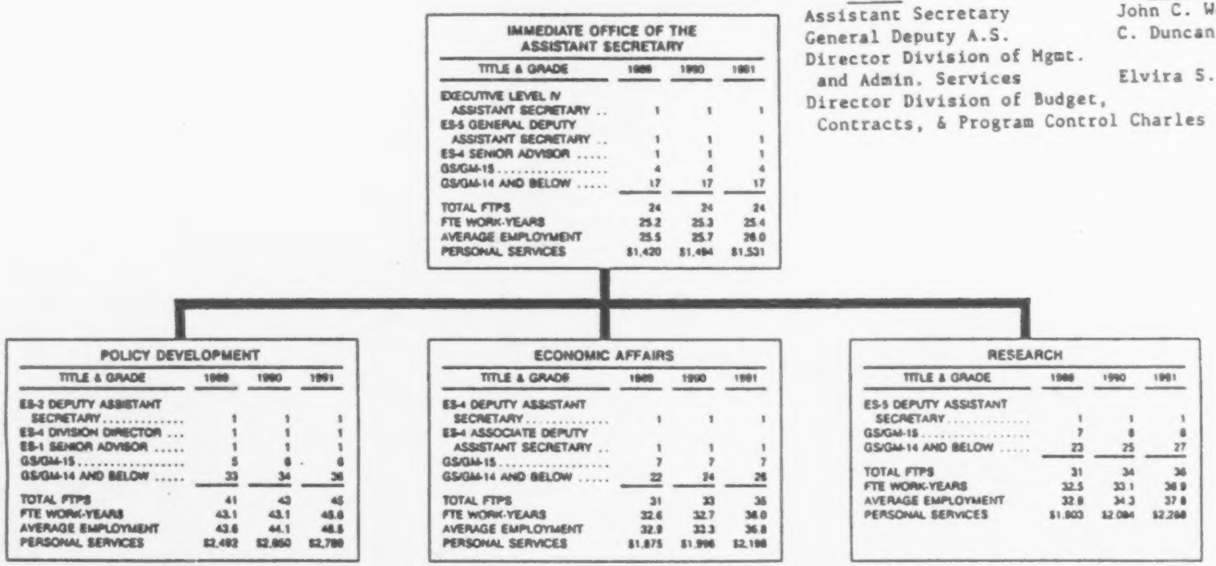
ANSWER: Listed below are priorities for further study:

- -- Maintaining affordability of housing for low-income families;
- -- Creating jobs and economic development through enterprise zones;
- -- Helping to eliminate homelessness;
- -- Resident management, homesteading and ownership of public housing;
- -- Fair housing;

- -- Promoting a drug-free America;
- -- Developing improved methods of identifying and abating lead-based paint hazards;
- -- Studying the impact of rent control; and
- -- Evaluating and monitoring programs of the department.

Specific estimates of the costs of these research topics are not now available. Moreover, the estimated costs depend on the amount of funds made available by the Congress to the Research and Technology account. Also, many of the topics are cross-cutting, making it difficult to project costs until the actual research design of each specific study is completed.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
POLICY DEVELOPMENT AND RESEARCH
DETAIL OF FULL-TIME PERMANENT (FTP) EMPLOYMENT
(PERSONAL SERVICES IN THOUSANDS)



IMMEDIATE OFFICE OF THE ASSISTANT SECRETARY

TITLE & GRADE	1989	1990	1991
EXECUTIVE LEVEL IV ASSISTANT SECRETARY ..	1	1	1
ES-5 GENERAL DEPUTY ASSISTANT SECRETARY ..	1	1	1
ES-4 SENIOR ADVISOR	1	1	1
GS/GM-15	4	4	4
GS/GM-14 AND BELOW	17	17	17
TOTAL FTPS	24	24	24
FTE WORK-YEARS	25.2	25.3	25.4
AVERAGE EMPLOYMENT	25.5	25.7	26.0
PERSONAL SERVICES	$1,420	$1,494	$1,531

Title	Name
Assistant Secretary	John C. Weicher
General Deputy A.S.	C. Duncan MacRae
Director Division of Mgmt. and Admin. Services	Elvira S. Tiensivu
Director Division of Budget, Contracts, & Program Control	Charles Taylor

POLICY DEVELOPMENT

TITLE & GRADE	1989	1990	1991
ES-2 DEPUTY ASSISTANT SECRETARY	1	1	1
ES-4 DIVISION DIRECTOR ...	1	1	1
ES-1 SENIOR ADVISOR	1	1	1
GS/GM-15	5	6	6
GS/GM-14 AND BELOW	33	34	36
TOTAL FTPS	41	43	45
FTE WORK-YEARS	43.1	43.1	45.6
AVERAGE EMPLOYMENT	43.6	44.1	46.5
PERSONAL SERVICES	$2,492	$2,650	$2,780

Title	Name
Deputy A.S.	Thomas M. Humbert
Director Division of Policy Development	Jill Khadduri
Director Division of Policy Studies	Martin Abravanel
Director Research Utilization Division	Katherine O'Leary
Director Demonstration Division	Hartley Fitts

ECONOMIC AFFAIRS

TITLE & GRADE	1989	1990	1991
ES-4 DEPUTY ASSISTANT SECRETARY	1	1	1
ES-4 ASSOCIATE DEPUTY ASSISTANT SECRETARY ..	1	1	1
GS/GM-15	7	7	7
GS/GM-14 AND BELOW	22	24	26
TOTAL FTPS	31	33	35
FTE WORK-YEARS	32.6	32.7	36.0
AVERAGE EMPLOYMENT	32.9	33.3	36.8
PERSONAL SERVICES	$1,875	$1,996	$2,198

Title	Name
Deputy A.S.	Susan E. Woodward
Associate Deputy A.S.	Frederick J. Eggers
Dir. Div. of Hsg. and Demographic Analysis	Duane T. McGough
Dir. Div. of Hsg. Finance Analysis	Harold L. Bunce
Dir. Div. of Economic Market Analysis	David Shenk
Dir. Econ. and Public Finance Division	John P. Ross

RESEARCH

TITLE & GRADE	1989	1990	1991
ES-5 DEPUTY ASSISTANT SECRETARY	1	1	1
GS/GM-15	7	8	8
GS/GM-14 AND BELOW	23	25	27
TOTAL FTPS	31	34	36
FTE WORK-YEARS	32.5	33.1	36.9
AVERAGE EMPLOYMENT	32.9	34.3	37.8
PERSONAL SERVICES	$1,803	$2,084	$2,268

Title	Name
Deputy A.S.	James W.Stimpson
Dir. Div. of Innovative Technology	Ronald J. Morony
Dir. Hsg. and Community Studies	Paul K. Gatons

RESEARCH ACTIVITIES

SENATOR MIKULSKI: Would you supply the Committee with the following: A list of the major research activities currently being undertaken by PD&R, including the time they began, the expected time of completion, their estimated total costs and the estimated annual cost for PD&R's FY 89 and FY 90 budgets (along with any contributions being made from other sources, e.g. different elements of the HUD Departmental budget); and the organization within PD&R, showing a complete list of your staff, and who is working on which projects, including the project directors of each project and to whom they report;

ANSWER: Following is a list of major research activities currently underway and projected costs to completion. All of these activities are funded directly from the Research and Technology appropriation without contributions from other sources.

ACTIVITIES	Year Began	Year for Completion	1989 Actual	1990 Est.	1991 Est.	Total	Division Director
			(Dollars in Thousands)				
Multifamily stock study........	1989	1991	$573	$577	$643	$1,793	P. Gatons
Income tax credit evaluation...	1988	1992	800 b/	125	750 d/	1,675	J. Ross
Resident mgmt evaluation.......	1990	1991	...	350	379	729	P. Gatons
Project based accounting.......	1989	1990	125	150	...	275	P. Gatons
Cost of accessible housing.....	1990	1991	...	250	...	250	P. Gatons
Supportive housing evaluation..	1990	1992	...	120	380 d/	500	P. Gatons
Urban homesteading assessment..	1989	1991	150	132	...	282	R. Morony
Affordable Housing standards...	1990	1990	...	150	...	150	R. Morony
Lead abatement survey..........	1989	1991	921	302	90	1,313	R. Morony
Housing surveys................	1972	a/	12,516	13,123	14,650	NA	D. McGough
Housing finance studies........	1971	a/	312	766	1,000	NA	H. Bunce
Housing discrimination study...	1988	1990	1,424 c/	691	...	2,115	P. Gatons
Transfer of Research Results...	1978	a/	1,030	673	750	NA	K. O'Leary

a/ These activities are funded annually and continue indefinitely, therefore, total costs are not applicable.

b/ Includes $700 thousnd of 1988 costs.

c/ Includes $600 thousand of 1988 costs.

d/ Estimated funding in 1991/1992.

HOMELESSNESS

SENATOR MIKULSKI: If not currently underway, is HUD planning to conduct research on the magnitude and detailed characteristics of the housing needs of the poor and homeless in the U.S.?

ANSWER: Since the 1984 HUD survey of the homeless, there have been no other efforts by HUD to estimate the number or characteristics of the homeless. There have been efforts by various special interest groups to do so, a number of which have used the HUD study as a baseline. Currently, HUD has no plans to conduct another national survey; instead it will use the results and analyses of the 1990 Census of the homeless.

During fiscal years 1990 and 1991, HUD will study the characteristics of the McKinney homeless programs. An evaluation of the Supportive Housing Demonstration Program, which supports transitional housing for the homeless and permanent housing for the handicapped, will gather extensive data on its clients in early 1991. An evaluation of Emergency Shelter Grant program will also analyze its client characteristics.

PUBLIC HOUSING RESEARCH

SENATOR MIKULSKI: Other than lead paint and CIAP issues of public housing, what research items are being carried out in conjunction with the Office of Public Housing?

ANSWER: PD&R is evaluating resident management in public housing. PD&R is also collecting street addresses and site identification codes for public housing and HUD multifamily assisted housing (excluding Indian Housing and Section 8 Existing Certificates and Housing Vouchers). This study will provide HUD with an up-to-date listing of project addresses, project numbers, and total number of units for Central Office administration of public housing and other assisted housing programs. We expect to complete it in the first quarter of fiscal year 1991.

Another PD&R project introduces a contract to develop minimum standards and procedures for a project-based accounting system for the public housing program. A guidebook for project-based accounting for PHAs is expected to be available by the end of this summer.

HUD PD&R QUESTIONS

SENATOR MIKULSKI: Your proposal adds $25 million for program evaluations and monitoring. You say this request is not relying technically on the authorization in section 124 of the HUD Reform Act. In what ways does it differ?

ANSWER: The HUD Reform Act specified that not more than 50 percent of amounts made available could be used on grants, contracts, or interagency agreements. The Department proposes that all amounts be made available for grants, contracts or interagency agreements. The Budget request also indicates the $25 million would be transferred to the Research & Technology budget from selected program appropriations rather than being a the direct appropriation as authorized.

SENATOR MIKULSKI: That Act indicated that at least 50 percent of the $25 million authorized was to be used to develop an in-house capability. Based on the small increase you show in personnel, apparently this is one of the differences?

ANSWER: That is correct. None of the $25 million would be used to hire additional HUD staff. Rather, the costs of the additional staffing proposed in the Budget would be paid out of Salaries and Expenses.

SENATOR MIKULSKI: The Act also directed HUD to report annually on the use of these funds. If you receive this request, would you consider yourself subject to that requirement?

ANSWER: Yes, we will comply with all reporting requirements.

SENATOR MIKULSKI: Do you intend reviews other than those specified in Section 124?

ANSWER: Yes, for instance, we will conduct a comprehensive set of evaluations of the Administration's new HOPE proposals.

SENATOR MIKULSKI: How do you have a 50% increase in outlays and a 130% increase in obligations with an increase of less than 10 personnel?

ANSWER: Obligations incurred for contractors in any single fiscal year are not fully disbursed within that year. Outlays generally occur within a 4-year cycle. Approximately 30 percent of the obligations will be disbursed in the first year. Outlays in the Research and Technology Account are not tied to personnel increases.

SENATOR MIKULSKI: How many personnel will be devoted to program evaluations and monitoring? Where are they located organizationally?

ANSWER: We requested 147.1 staff years for the Office of Policy Development and Research (PD&R). The Assistant Secretary for PD&R is responsible for the program evaluation and monitoring discussed here.

INSPECTOR GENERAL

SENATOR MIKULSKI: Your description of the program evaluation and monitoring role of the policy development and research office sounds very similar to an internal audit or IG function. In fact, this budget request is for not too much less money than for the IG. What is the difference between the two, and how did you select PD&R over the IG for the section 124 role?

ANSWER: Public Law 95-452, Inspector General Act of 1978, as amended, establishes the charter under which the Office of Inspector General (OIG) functions. Specifically, the OIG is an independent and objective departmental organization charged with: (1) reviewing existing and proposed legislation and regulations concerning the impact of such legislation or regulations on the economy and efficiency in the administration of HUD programs and operations or the prevention and detection of fraud and abuse; (2) recommending policies for the coordinate relationships between HUD and other Federal agencies, state and local governmental agencies with respect to matters relating to the promotion of economy and efficiency in, or the prevention and detection of, fraud and abuse in HUD programs and operations; and (3) providing policy direction for and to conduct, supervise, and coordinate audits and investigations relating to the programs and operations of HUD.

Office of Management and Budget Circular Number A-73, dated June 20, 1983, set forth the policies to be followed by the OIG, HUD, in auditing Departmental operations and programs. The OIG must, under the provisions of A-73, provide adequate audit coverage of Departmental programs to aid in the determination that information provided by them is reliable; resources have been safeguarded; funds have been expended in a manner consistent with related laws, regulations, and policies; resources have been managed economically and efficiently; and desired program results have been achieved.

The OIG identifies the organizations, programs, activities and functions within the Department that are subject to audit. These areas are reviewed and ranked based upon the following criteria: (1) statutory and regulatory requirements; (2) adequacy of internal control systems as indicated by vulnerability assessments and internal control review; (3) newness, changed conditions, or sensitivity of the organization, program, activity or function; (4) current and potential dollar magnitude; (5) extent of Federal participation in terms of resources or regulatory authority; (6) management needs to be met; (7) prior audit experience; (8) timeliness, reliability, and scope of audits performed by others; results of other evaluations; and, (9) availability of audit resources. After completing this review, an audit plan is developed each fiscal year which identifies the programs and operations that have been selected for audit.

The IG does not monitor or evaluate programs in the same way the PD&R does. PD&R will assist in determining whether programs are reaching their intended beneficiaries and providing the intended benefits, whether program costs are reasonable, and whether programs are having any unintended affects.

We think that PD&R is ideally positioned for this type of evaluation and monitoring because it doesn't have direct program responsibilities, and can be more objective in developing information needs for the various programs and the Secretary.

SENATOR MIKULSKI: The IG is requesting an increase of over 50 staff. Why are both increases needed?

ANSWER: The OIG's 1990 appropriation authorized 525 full-time equivalent appointments and 528 staff-years. This was an increase of 33 full-time equivalents over 1989 level of 492 and a staff-year increase of 34.7 over 1989 level of 493.3. However, due to the Gramm-Rudman-Hollings sequestration, Appropriation Act Reductions (Section 517), and under estimation of the OIG's average staff-year cost upon which the 1990 request for personal services was based, the OIG has been unable to achieve this increase. The 1991 request is for 550.4 staff-years, an increase of 55.2 staff-years over 1990. This would support 545 full-time permanent positions.

The staffing increase the OIG is requesting in the 1991 Budget request is directly related to the OIG's ability to continue and expand its most recent program initiatives concerning the early detection and correction of significant problems within major Departmental program areas. In addition, the OIG's investigations have become more complex and nationwide in nature, resulting in more, and far ranging, joint investigative efforts with other Federal law enforcement agencies, such as the Federal Bureau of Investigation. Also, a number of U.S. Attorneys have directly requested additional OIG Special Agents to assist them with unique and complex investigations in their districts. For example, a considerable number of the investigations the OIG conducts requires Special Agents to participate fully in the judicial process, including spending the time necessary to assist with Grand Jury activity, trial preparation, working with prosecutors during the trial, and pre-sentencing activities. With Agent responsibility in the judicial process and its attendant mandatory requirements, a case becomes almost all-encompassing of an Agent's time once the case enters the Grand Jury phase. Continuing Congressional hearings and media attention have served to bring additional attention to the need for supplementary staffing resources.

Presently, the OIG has approximately 1,400 cases under investigation, of which the OIG is leading the investigation in 714 and the FBI is leading in 679. A great many of these cases are joint investigations. Another 220 cases have been referred by the OIG to U.S. Attorneys for disposition through either indictment, trial, sentencing, or declination of prosecution. All of these cases involve alleged fraud or serious irregularities in the administration of HUD programs.

PD&R will not be performing audits or investigations of the type proposed by the IG. We are attempting to earmark a small share of program funds so that PD&R can perform evaluation and monitoring activity along the lines of HHS and the Department of Education where they routinely set aside a part of program funds for evaluation.

SENATOR MIKULSKI: Wouldn't the program people have a role to play in evaluation and monitoring, and then just have one external monitor/reviewer (i.e., the IG)?

ANSWER: In developing the evaluation and monitoring program, the Assistant Secretary for Policy Development and Research met with every other Assistant Secretaries in the Department. Their input is reflected in the evaluation and monitoring plan. All HUD principal staff will be continuously involved in the process, but PD&R will have the lead responsibility.

As explained previously, the OIG and the Office of PD&R have completely different functions and responsibilities. However, they complement each other and assist program management in carrying out their functions and responsibilities with maximum efficiency and economy and minimal waste and mismanagement. Program officials also have a valuable and important role (as described in OMB Circular A-50) which is integral to effective program evaluation and monitoring. The three distinctive roles of the OIG, PD&R, and program offices serve to create the most effective management structure to ensure that Departmental programs are carried out effectively in order to attain their goals and objectives as intended.

FEDERAL HOUSING ADMINISTRATION (FHA) ISSUES

SENATOR MIKULSKI: How short in staff is the FHA? How many additional staff could FHA absorb in '91?

ANSWER: We believe that the Department's 1991 staff-year request for Housing is sufficient to enable us to allocate the appropriate level of staff to FHA activities.

SENATOR MIKULSKI: Last year we raised the single-family mortgage limit from $101,500 to $124,875. Do you have any information yet about whether or not this step will help or hurt FHA's soundness?

ANSWER: A recent Price Waterhouse actuarial analysis of the MMI Fund concluded that, contrary to popular impression, raising the loan limits will not help the MMI Fund. The actuarial position of the fund will not be materially affected. Higher value loans are just as likely to default as lower valued ones, if they have the same down payment and loan-to-value ratio.

SENATOR MIKULSKI: Given the fact that two relatively "low-cost" regions, regions 6 and 8, account for over 50 percent of FHA's losses for the latest year for which data is available, doesn't diversification of the fund into higher-cost areas, where the economy is stronger, make sense?

ANSWER: The Price Waterhouse analysis concluded that "Geographical distribution is significant because regional economies can vary widely and have a significant impact on claim rates." However, Price Waterhouse did not make a recommendation to address the MMI Fund's actuarial requirements through geographical diversification. Instead, the study recommends changes to the premium structure together with revised underwriting criteria as a more appropriate approach to making the Fund sound.

SENATOR MIKULSKI: Why does HUD's 1991 budget "assume" the revenues from keeping the FHA limit at $124,875, but not propose legislation to extend it beyond its September 30 sunset? What's your position on the $124,875 limit?

ANSWER: HUD does not believe that the FHA mortgage limits should be raised above the current $124,875 level. The Department is suggesting to the authorizing committees that the $124,875 level be made permanent.

SENATOR MIKULSKI: HUD terminated its multifamily co-insurance program and promised to replace it with a "delegated processing" program this year. When will HUD issue regulations to implement this program?

ANSWER: The delegated processing program is currently under consideration, so it would be premature to discuss issuance of regulations.

SENATOR MIKULSKI: One of the concerns with co-insurance was lack of oversight and review by HUD, which in turn led to major FHA losses in certain instances. Given that, have you allocated additional staff to deal with delegated processing?

ANSWER: The delegated processing program is under consideration and staffing is certainly one of the aspects of the program which will receive attention.

SENATOR MIKULSKI: How many staff people will you provide for delegated processing in 1991 and how does that compare with the staffing levels for multifamily co-insurance in FY 89 and FY 90?

ANSWER: Again, the delegated processing program is now under consideration and the staffing needs and resources are being determined.

SENATOR MIKULSKI: Do you believe that government credit enhancement of some sort is absolutely crucial to the construction of affordable rental housing?

ANSWER: Government credit enhancements are a significant tool in the development of affordable rental housing.

SENATOR MIKULSKI: How many units of rental housing has the co-insurance program produced since its inception?

ANSWER: Program records indicate that under Section 221(d)(4), as of April 1, 1990, 52,779 units have been constructed of which 9,657 were under the Section 221(d) Retirement Service Center Program. Under Section 223(f) there are 306,671 units which have been purchased or refinanced.

SENATOR MIKULSKI: What percentage of these apartments were for low- and moderate income families?

ANSWER: Most of the apartments financed under Section 221(d) and 223(f) are serving families of low- and moderate-income. These units are primarily unsubsidized, and are of moderate size and quality and rent at market rates. As you know, FHA insurance programs (other than those which also involve some form of subsidy) do not restrict the income of occupants but only the amount of the mortgage.

SENATOR MIKULSKI: During the same time period, approximately how many rental housing units were constructed under HUD's full insurance program?

ANSWER: Since the beginning of fiscal year 1986, our program records show that the full insurance program has produced about 62,000 new units [primarily under Section 221(d)].

SENATOR MIKULSKI: Given these figures, is it fair to say that co-insurance has been effectively HUD's only vehicle for the construction of affordable rental housing?

ANSWER: In fiscal year 1988, program records show that 13,840 units were produced under coinsurance 221(d) compared to 35,007 total Section 221 multifamily units. Therefore, while coinsurance has been significant, it has not been HUD's only vehicle for construction of rental housing.

SENATOR MIKULSKI: Since Secretary Kemp's announcement on January 17 of this year that the co-insurance program was to be terminated, how many co-insurance projects have been approved under the new precommitment review requirements?

ANSWER: Very few projects were submitted for precommitment review until several weeks after the January 17, 1990 announcement. The review process takes up to 45 working days. Twenty five cases were submitted by April 25, when the U.S. District Court restrained HUD from enforcing precommitment reviews. Reviews of two cases were completed prior to the court order.

SENATOR MIKULSKI: How many have been approved under the existing full insurance program within the same time frame?

ANSWER: Seven projects have been approved under full insurance since January 17, 1990.

SENATOR MIKULSKI: How exactly would a delegated processing program differ from "precommitment reviews," and if the two are indeed conceptually similar, why can't HUD implement delegated processing more quickly, particularly in light of the obvious need for a functioning government credit enhancement program?

ANSWER: In general, the delegated processing program will reserve the actual underwriting decisions and all of the risk for HUD. In coinsurance, the lender does the processing, makes final underwriting determinations, and retains a portion of the insurance risk. The delegated processing program is still under Departmental consideration.

SENATOR MIKULSKI: HUD has proposed that "star offices" be created to allow processing of new projects. Do you intend to contract out some of the functions that would be performed by these "star offices?"

ANSWER: The delegated processing program is under consideration and we have not finalized how we will staff this effort; however, there are no plans to create special "star offices" to handle the processing of new projects.

SENATOR MIKULSKI: Will delegated processing also require that personnel be shifted around HUD's various Field Offices? If so, does the Department foresee the need for additional 1991 funds to accommodate the costs for such personnel shifts?

ANSWER: The delegated processing program is now under consideration. Staffing issues are certainly part of the discussion regarding the program.

SENATOR MIKULSKI: HUD has not given instruction on precisely what is supposed to be reviewed under "precommitment reviews." Has the Department examined its credit enhancement program with a view toward identifying which aspects are the most critical to protecting HUD's financial interests?

ANSWER: The FHA and the Department of HUD have been attentive to these mortgage insurance underwriting issues since 1934. The critical elements in our review are the value of the property (the appraisal), the financial strength and credit history of the borrower, the quality of the physical design and construction (or the condition of a project in existing construction), and the strength of the surrounding economy and market.

SENATOR MIKULSKI: What do you think are the critical elements to review in a program like this, rents, expenses, land costs or something else? Would a review of these items be performed by a review appraiser?

ANSWER: In its consideration of the delegated processing program, the Department will review critical elements and staffing issues.

SENATOR MIKULSKI: If HUD performed the review appraiser function instead of the co-insurer, would this adequately protect the Department? If so, why? If not, why not?

ANSWER: Again, the delegated processing program is currently under consideration and final decisions have not been made.

SENATOR MIKULSKI: How does the decision in DRG, Inc. vs Department of Housing and Urban Development affect the financial soundness of the multifamily insurance fund?

ANSWER: As a result of the recent decision by the U.S. Court of Appeals, D.C. Circuit, denying HUD's motion for a rehearing on the subject case, the U.S. District Court will likely enter a judgement against HUD and in favor of DRG in the amount of approximately $4.3 million. The $4.3 million is the amount of debenture interest DRG is entitled to (under the "plain meaning" of the regulations, but limited by the statutory requirement that the lender absorb at least 10 percent of the loss) on the nine claims that were pending when GNMA took over DRG's portfolio in September 1988.

In a Final Rule published in August 1988, HUD corrected the flaw in the coinsurance regulations that was the basis for the DRG's lawsuit. That rule became effective in October 1988. No other lender had co-insurance debenture claims pending at that time.

SENATOR MIKULSKI: How do the potential losses compare on the coinsurance and full insurance programs because of this decision?
ANSWER: This decision does not impact on HUD's full insurance program. The impact on co-insurance is described above.

SINGLE FAMILY MORTGAGE INSURANCE ACTIVITY LEVELS

SENATOR MIKULSKI: The FHA maximum mortgage amounts were increased by this Subcommittee at the end of last year to $124,875. In addition, the Veterans Affairs Committee increased the maximum amount of VA guaranteed loans at the end of last year, and the Government National Mortgage Association has recently agreed to secure those mortgages.

The Subcommittee is concerned that the credit limitations on these programs enacted for FY 1990 and proposed for FY 1991 are inadequate.

Please provide revised projections for FHA and GNMA activity levels for the Subcommittee.

ANSWER: Based on the most current fiscal year activity, it appears that the enacted FHA commitment limitation of $73.8 billion will be more than adequate to cover commitments issued this year. The following table depicts the 1990 Budget estimate, usage through April 30 and projection for the balance of the year:

	FY Activity 4/30/90	Projection for FY 1990	FY 1990 Limitation
		($ in millions)	
Single family..........	$31,165	$61,450	$69,360
Multifamily............	1,353	3,061	3,379
Title I................	653	1,258	1,099
Total................	33,171	65,769	73,838

As indicated above, we anticipate that $8 billion of commitments will remain unused at the end of this year.

It is now estimated that the carryover of the single family mortgage limit of $124,875 into 1991 will result in 135,000 new applications. The 1991 Budget assumed 65,000 additional applications from the higher mortgage limits. The will have the effect of increasing commitment usage by about $.8 billion in the GI/SRI Funds and by $6.6 billion in the MMI/CMHI Funds. At the time the Budget request was developed, a cushion existed between the requested limitation level and expected usage of $1.8 billion in the GI/SRI Funds and $6.8 billion in the MMI/CMHI Funds. This cushion was provided in case actual activity proved to be higher than originally expected due to lower interest rates or other factors. Barring a decrease in interest rates, we would expect that a carryover of the higher mortgage limit could be fully absorbed within the available cushion.

GNMA:

The credit limitation requirements for GNMA are dependent upon FHA and VA activity. Based upon the current FHA and VA estimates, it is expected that commitment usage in 1990 will be $10 billion below the enacted level of $81.7 billion. For 1991, it is estimated that the full requested level will be used.

Urban Homesteading

SENATOR MIKULSKI: It appears from your budget justification that only a limited number of communities -- between 100 and 200 -- participate in the program. In the state of Maryland, for example, apparently only Prince Georges County participates. Some cities not participating are New York, Los Angeles, and Baltimore. Why?

ANSWER: There are currently 154 state or local government agencies approved to participate in the Urban Homesteading Program, with additional application approvals expected during the remainder of fiscal year 1990. There are a variety of reasons the number of participants is not higher, including: the amount of Section 810 funds available each year for distribution; the $25,000 cap on the amount of Section 810 funds that may be used to acquire individual single-unit properties; and the lack of available Federally owned, unoccupied properties in sufficient concentration in some markets to warrant designation of an Urban Homesteading neighborhood. High cost cities such as New York and Los Angeles are not participating in the program principally because there are insufficient numbers of Federally owned properties valued below $25,000 to support a viable program. Prince Georges County, Maryland is also a relatively high cost area and has only been able to participate by supplementing the limit of $25,000 in Section 810 acquisition cost per single unit property with an average of $30,000 in local funds, to purchase $50,000-$60,000 single-family properties for homesteading use.

SENATOR MIKULSKI: Can or should something be done to encourage greater participation?

ANSWER: The Department has encouraged greater participation in the homesteading program. Each of the past 3 years an average of 10-15 new agencies were approved for program participation.

To encourage even greater participation in the program, the Department is proposing a substantial increase in funding to $50 million in 1991. This will permit the homesteading of an estimated 2,780 properties as compared to an estimated 720 properties in 1990 based on a $13 million funding level.

SENATOR MIKULSKI: You say the average cost to repair these properties is nearly $23,000. Assuming these people cannot handle down payments and/or monthly payments, how do they handle a major repair bill along with property taxes, etc.?

ANSWER: While an average of $23,000 in costs for property rehabilitation may seem high, these costs are typically amortized over a 20 to 30 year period. In addition, the interest rate on a rehabilitation loan is generally offered at a below market rate, often as low as 3 percent. Under the Section 312 Rehabilitation Loan Program, for example, lower-income homesteaders receive a 3 percent, 20-year loan, which typically results in a monthly payment of $150 to $180 including principal, interest and property taxes. While home maintenance expenses must also be borne by the homesteader, LUHAs generally report that the typical homesteading family incurs lower monthly housing expenses owning a homestead property than that family previously paid in occupying a rental property.

SENATOR MIKULSKI: Is this program really providing housing to those who could not otherwise afford it, or is it just a "good deal" for those who do have some financial means?

ANSWER: In fiscal 1989, a full 94 percent of all homesteaders selected to participate in the program nationally were lower-income families (80 percent or less of area median income). Twenty-seven percent of all homesteaders selected last fiscal year were very low-income families (50 percent or less of area median income). An increasing, but undetermined, percentage of homesteaders are single-parent, female-headed households. The Department has made a strong effort to fully implement the "special priority" for lower-income family requirement of the 1987 amendments to Section 810.

SENATOR MIKULSKI: This program can obviously be a great benefit to some persons, but not to those of very low income. Is there help for those people, such as through Title V of the McKinney Act?

ANSWER: About 27 percent of all homesteaders selected in the last fiscal year were of very low-income (50 percent or less of area median income). However, by virtue of the statutory requirement that each homesteader rehabilitate their property to local standards for decent, safe, and sanitary housing using their own resources, the program can not easily serve those with minimal or no income. It does serve families and individuals who were homeless, but are employed on a reasonably regular basis and have sufficient income to cover the monthly rehabilitation loan payments, property taxes, and maintenance expenses.

Title V of the McKinney Act, is limited to the use of Federal properties to assist the homeless. It is for the leasing, rather than sale, of properties. Even if it were legislatively expanded, it would not offer significant help for homesteading or homeownership because of the non-residential nature of most of the properties that are available.

SENATOR MIKULSKI: Why is FHA reimbursed for its properties differently than VA or FmHA?

ANSWER: The statutory and regulatory requirements for reimbursements of the Federal Housing Administration (FHA), the Department of Veterans Affairs (VA) and the Farmers Home Administration (FmHA) vary. Within that legal framework, separate procedures have been established for reimbursements of each agency for purchasing their properties under the Urban Homesteading Program. Procedures for reimbursing the VA and FmHA for homesteading properties were developed to conform to guidance in the House/Senate Conference Committee Report of the Housing and Community Development Amendments Act of 1979. At that time, the Secretary was directed to base VA and FmHA reimbursement upon the lesser of the market value of the property and the amount of the claim plus ownership expenses. Reimbursement procedures relative to FHA properties purchased with Section 810 funds are based on normal and customary procedures FHA has established for the sale of FHA-owned properties except that the sale price is discounted 10 percent below fair market value when the purchaser is a LUHA or local government agency.

SENATOR MIKULSKI: Is it fair to say that fair market value is generally less than the agencies claim?

ANSWER: No, there is no overall pattern that has established either fair market value or the agency's claim as generally the lesser amount. Since the claim amount includes the sum of the amount owed to the holder of the mortgage guarantee, acquisition costs, and expenses related to ownership and sale of the property, it may or may not be greater than the property's fair market value.

SENATOR MIKULSKI: How do you determine the number of properties to include in this program?

ANSWER: There is no predetermined number of properties to be acquired with Section 810 funds each year. Rather, we encourage LUHAs to acquire as many properties as possible meeting both Federal selection criteria and the LUHAs own selection criteria. Funds are distributed to HUD's Regional Offices using a formula reflecting both prior Regional performance in using Section 810 money and availability of Federal properties priced below $25,000 in each Region. After distribution to the Field Offices, LUHAs reserve funds for individual properties on a first-come, first-served basis. The number of properties acquired by the end of the fiscal year is therefore a function of the average price of LUHA-selected properties and the total amount of Section 810 funds available. It is for this reason that we have encouraged the acquisition of less expensive properties by LUHAs, when possible, and have not proposed further increases in the $25,000 price cap on single-unit properties.

SENATOR MIKULSKI: What criteria do you use for identifying specific properties?

ANSWER: Local Urban Homesteading Agencies (LUHAs) have full responsibility for the actual selection of properties to be homesteaded using required Federal criteria together with local criteria added at the discretion of each LUHA. The Federal criteria include the statutory requirements that each property be: a one-to-four unit Federally owned residential dwelling, unoccupied, located in an approved homesteading neighborhood, and "suitable for use in an urban homesteading program." The Department has interpreted the "suitability" provision as requiring that the property be unrepaired and be valued at, or below, $25,000 for a single-unit residence with an additional $8,000 for each additional unit up to four units. The discretionary local criteria vary widely but typically include factors designed to consider the "marketability" of the unit to potential homesteaders and the reasonableness of expected rehabilitation costs in relation to the expected after-rehabilitation value of the property.

Rental Rehabilitation Grants

SENATOR MIKULSKI: This program provides vouchers or certificates along with rehabilitation grants, and focuses on low income tenants, yet displacement apparently still occurs. Could you elaborate on this, and offer suggestions?

ANSWER: Our data indicates that very little displacement has resulted from Rental Rehabilitation Grants program (RRGP) activities. Based on the Annual Performance Reports (APRs) that grantees submitted for fiscal year 1989 (approximately 80 percent of the grantees submitted timely APRs on which the data is based), 96 households were reported as being displaced, or moved involuntarily from an RRGP project. Another 857 households were reported to have been relocated, or moved from one unit in an RRGP project to another unit in the project. A total of 9,912 units were reported to have been occupied before rehabilitation, so less than 1 percent of the tenants were reported to have been displaced and 8.6 percent were reported to have been relocated. Displacement in the RRGP is usually caused by overcrowding or physical rehabilitation.

When displacement occurs in the RRGP, the displaced tenant receives assistance, often a Section 8 certificate or housing voucher and moving expenses. In the RRGP, the eligible tenants living in the project before rehabilitation may use the Section 8 certificate or housing voucher to help pay the rent in the newly rehabilitated RRGP unit or may move to other standard housing. The tenant is not required to continue to live in the RRGP project to receive the tenant assistance.

SENATOR MIKULSKI: This program is limited to communities of 50,000 people or more, except as a demonstration program. Thinking of such places as small coal-mining towns that are having hard times, do you see this as a wise restriction?

ANSWER: The program is not limited to communities having a population of 50,000 or more. Communities having a population under 50,000 are not, by law, eligible for a direct formula allocation, but they may participate in a State RRGP. Even rural communities eligible for FmHA assistance under Title V of the Housing Act of 1949, which are not otherwise eligible for RRGP funds may, under Section 311 of the Housing and Community Development Act of 1987, participate in a Rural Rental Rehabilitation Demonstration Program until September 30, 1991. The Department has proposed a legislative amendment for each of the last few years to allow Title V-eligible areas to participate on a permanent basis in the RRGP. If the Department's proposal were enacted, State's Rental Rehabilitation Grant funds could be used in areas eligible for assistance under Title V of the Housing Act of 1949 (in both State administered and HUD administered State programs).

SENATOR MIKULSKI: Apparently, FmHA has a similar program for rural areas. Do you know how active their program is?

ANSWER: FmHA is not currently operating a program similar to the RRGP in rural areas. That is why Congress authorized the Rural Rental Rehabilitation Program Demonstration. The Housing Preservation Grant Program that was authorized by Section 533 of the Housing and Urban- Rural Recovery Act of 1983 has been used so far only for single family owner occupied properties.

SENATOR MIKULSKI: Your annual report indicates that recipients are often profit-making organizations and that communities often provide them funds as grants or forgivable loans. How do you ensure that this program does not provide a windfall to the landlord or serve as a disincentive for him to properly maintain the property from his own revenues?

ANSWER: The Rental Rehabilitation Grants program (RRGP) does not provide a windfall to landlords. However, HUD is going to re-evaluate this program because questions, such as "windfall profits, have arisen. In fact, some data indicate that rehabilitation of some units would have occurred without the Rental Rehab assistance the units received. One of the advantages of the program is a "split subsidy approach" for rehabilitating rental properties. One subsidy goes to write-down the cost of rehabilitation and basically provides the difference in what the owner can afford to borrow from a private lending institution and what is actually needed to bring the property to standard condition. The RRGP funds must be matched by at least an equal amount of private and/or other public funds. On average, owners themselves put up $1 for every $1 in RRGP funds.

The other subsidy, which is a tenant subsidy, goes to the eligible lower income tenants living in the project before rehabilitation. The tenants can either use the tenant subsidy to help pay the rent in the newly rehabilitated unit or can move to another standard rental unit. Even if the tenant chooses to stay in the RRGP project initially, he or she may move in a year.

The fact that the tenant can take the Section 8 certificate or housing voucher and move elsewhere is an incentive for the owner to keep the property well maintained--first to encourage the existing tenant to stay and second to attract other tenants if the initial tenant moves.

SENATOR MIKULSKI: Rental rehabilitation funds are generally not available for use in rural areas, and you are now proposing that they not be available in communities with rent controls. Why? Where does that leave the program active?

ANSWER: The Administration favors legislation which would make localities having rent controls ineligible for Rental Rehabilitation Program (RRP), including those localities with generally applicable rent controls which predated the November 1983 enactment of the program. Under current law, RRP assistance is available to localities with pre-November 1983 rent controls. As a practical matter, the new proposal will impact only on a relatively small number of localities since the vast majority of RRP grantees do not have controls.

The Administration believes that the imposition of rent controls is a disincentive to owners of rental property to maintain or improve their property since the rent they could charge is capped. Also, the absence of rent controls plus subsidies not tied to the unit serve as an incentive to the owner to maintain the property because, if the tenant moves out, the owner is not guaranteed any rental income and would need to attract another tenant. A well-maintained unit would be more marketable.

Section 312 Rehabilitation Loans

SENATOR MIKULSKI: It appears from reading your annual report that demand for these funds is high. Won't it be even higher if you expand the homesteading program?

ANSWER: Since the initiation of the Urban Homesteading program in 1974, Section 312 loans have been a source of rehabilitation financing. At present, about 46 percent of the homesteaders use Section 312 funds to rehabilitate their properties, 39 percent use other public (mostly CDBG) funds and 15 percent use private financing. However, the use of Section 312 funds by homesteaders has declined significantly from a peak of 75 percent in 1985.

There will always be a demand for a low-interest rate loan program but demand is not always the best indicator of an effective program. Rather, we believe that locally-designed programs, using CDBG funds, is a better way to provide rehabilitation assistance to homesteaders.

SENATOR MIKULSKI: Does the need or desire to terminate this programs suggest there may be a problem with either this program or the Urban Homesteading Program, such as loan defaults or repossessions?

ANSWER: No. Loan delinquencies in the Section 312 Program have dropped from 23 percent in 1985 to under 13 percent in the first quarter of 1990. Urban Homesteading has experienced slightly higher delinquency rates, but the problem has been centered in a few cities experiencing problems in their local economies.

The recommendation to terminate the Section 312 Program is based on the belief that locally designed rehabilitation programs are more cost effective. Frequently these local programs have included the use of CDBG funds with cities programming over 30 percent of their block grants for housing rehabilitation.

SENATOR MIKULSKI: You propose terminating this program and replacing it with more vouchers. What is the logic in replacing loans with grants? High default rate, etc.?

ANSWER: The proposal to terminate the Section 312 program is not linked with vouchers. We do believe that flexible subsidies used to leverage private funds in financing rehabilitation can produce more units, in less time and with less public money than any other use of public funds, including a direct loan.

Rental Housing Assistance for the Homeless

SENATOR MIKULSKI: Wouldn't a voucher program, such as your proposed rental housing assistance effort for the homeless, which focuses on those with the need for supportive services, make it more difficult and/or expensive for these people to be placed where they can receive the counselling or other special services they need?

ANSWER: The goal of homeless assistance programs is to move as many homeless persons as are capable to independent living. In addition to preparing persons for independent living, the problem of securing housing must be solved. This program addresses that problem by providing rental assistance and combining it with supportive services. Grantees must put together a strategy for providing sufficient services for each participant and to make them available throughout the 5 year period.

To overcome difficulties and reduce expenditures that could arise when participants are scattered over a wide geographic area, the proposed program provides flexibility for recipients to require residents to live in a particular structure for the first 2 years of participation. For those 2 years, the supportive services can be provided at one location. In the next 3 years, recipients can be required to live in a particular geographic area. It is expected that the amount of services needed will be most intense in the first 2 years and will decline significantly in the next 3.

SENATOR MIKULSKI: Do you have any hard data as to what portion of the rent the average person in this program would be able to pay?

ANSWER: Recipients will pay no more than 30 percent of their monthly gross adjusted income, or 10 percent of their monthly gross income, or a locally designated portion of public assistance, in rent, as is the case now. As a person's situation improves, it is expected that their contribution will rise to the 30 percent level. The Shelter Plus Care program is flexible because the rent subsidy may equal up to 125 percent of a fair market rent for a particular area of the country as long as the grantee can guarantee rental assistance will be provided for the full 5 year period. This flexibility recognizes that there are a wide variety of housing settings that are conducive to returning the individual to the most independent living situation possible.

SENATOR MIKULSKI: You estimate that the $160.8 million will house 6,600 homeless persons over a 5 year period. That's over $400 a month per person. How does that compare with your other programs?

ANSWER: Comparing the costs of the Shelter Plus Care program with other HUD McKinney Act programs is difficult given the differences between them. The Shelter Plus Care Program is a rental assistance program, whereas the Emergency Shelter Grant and Supportive Housing Programs provide grants for the hard costs of development in addition to grants for operating costs and supportive services. Although all programs include provisions for the funding of supportive services, in the Shelter Plus Care program, rental housing assistance can only be provided if supplemented with at least an equal amount of funds for supportive services from other sources. In the Emergency Shelter Grant and Supportive Housing programs, the costs of supportive services are shared between HUD and the applicant.

The figure compares closely with the average fair market rent for an efficiency apartment of $362 for fiscal year 1991. That average represents efficiency apartment rents which range from approximately $200 to $600 across the country. The average for larger communities, where most Shelter Plus Care participants will reside, would be somewhat higher than the national average and nearer to the estimated $400.

SENATOR MIKULSKI: Doesn't this program also lose the leveraging of matching non-federal funds that comes with most of the other McKinney Act programs?

ANSWER: The Rental Housing for the Homeless program does not lose the matching of non-Federal funds that comes with other McKinney programs. The program requires that States, units of general local government and Indian tribe applicants match the funds provided for rental assistance with supportive services during the full 5-year term of housing assistance. This supportive services match may come from federal, State or local government sources, but may not be funded from the appropriations for the Shelter Plus Care programs. Projects will, for the most part, be operated by nonprofit organizations experienced in the provision of assistance to the homeless.

SENATOR MIKULSKI: In conjunction with these new efforts, you are in effect proposing that the Supplemental Assistance for Facilities to Assist the Homeless (SAFAH) program be terminated. Why do you no longer see a need for this program?

ANSWER: The goal of SAFAH is to encourage and to support innovative, comprehensive approaches to serving homeless persons. This can be done, and done more cost-effectively, with HUD's other McKinney Act programs. Almost all of the applications for SAFAH assistance proposed projects and activities already eligible under the Transitional or Permanent Housing, Emergency Shelter Grants, or Section 8 SRO Moderate Rehabilitation programs, not to mention the Community Development Block Grant program and HUD's new initiatives.

It would be a far wiser use of scarce Federal resources to attend to these efforts rather than continue to encourage hard-pressed service providers, who could spend the extra time serving homeless persons, to pursue a SAFAH grant. Recognizing, encouraging, and supporting innovation is a part of those programs, too.

SENATOR MIKULSKI: I am concerned about the Administration's proposed reduction of FEMA's Emergency Food and Shelter Program, which appears to provide services that other McKinney programs do not. To what extent would any of HUD's programs fund food banks and soup kitchens; i.e., operations which aid the homeless but are not shelters?

ANSWER: Under the Emergency Shelter Grants (ESG) program, food banks, soup kitchens, health clinics, and other non-shelter-based services for the homeless are an eligible "essential service" activity. Although each grantee is limited by statute to spending 20 percent of its grant award for such services, there is also a provision in the legislation to waive this cap, which HUD has begun to implement more liberally with the fiscal year 1990 ESG allocation.

Off-site services for residents of Transitional and Permanent Housing would also be fundable under those two programs.

SENATOR MIKULSKI: Aren't all of HUD's McKinney Act funds, even Emergency Shelter Grants to a large degree, awarded on a competitive basis?

ANSWER: HUD allocates its ESG program funds to grantees (metropolitan cities, urban counties, states, and territories) on the basis of a statutory formula. City, county, and territory grantees may spend the funds themselves on services to the homeless or further distribute part or all of their grant award to nonprofit providers. States must distribute all of their grant award to units of local government or nonprofits.

HUD requires each grantee to state in its application the method it plans to use to distribute its allocation, but there is no requirement that any particular procedure, i.e., competitive, formula-based, discretionary, etc., be followed. However, by far the vast majority of grantees distribute their ESG funds through a competitive process.

HUD's other McKinney Act programs are 100 percent competitive.

SENATOR MIKULSKI: Don't they also go to a limited number of communities, and a limited number of shelters in those communities, relative to FEMA's program?

ANSWER: Since its inception in 1986 through fiscal year 1988, the latest year for which detailed data are available, the Emergency Shelter Grants (ESG) program has provided assistance to over 2,000 shelters in 800 communities with a capacity to serve more than 70,000 individuals. In addition, close to 400 Transitional Housing, 150 Permanent Housing, and 50 Supplemental Assistance for Facilities to Assist the Homeless (SAFAH) projects have been awarded to date; these grants represent multiple (up to 5 years) year funding. Another approximately 200 Transitional Housing, 75 Permanent Housing, and 20 SAFAH projects will be awarded in fiscal year 1990. The ESG data do not take into account $119.6 million in funds allocated in fiscal years 1989 and 1990. Although these numbers do not match those under the FEMA program, they nevertheless do represent considerably more than a "limited number" of communities and shelters. The grants are almost always many times larger than FEMA grants, and they provide funds for rehabilitation, an activity usually not undertaken with

FEMA grants. ESG funds are also concentrated, more so than through FEMA, in larger communities where the homeless problem is more severe while states have the option under ESG to focus their attention on major metropolitan areas or award smaller FEMA-size grants to a greater number of communities.

SENATOR MIKULSKI: Two locations from the state of Maryland were selected more or less at random -- Baltimore City and Allegany County. I was advised that FEMA's program funded 27 and 10 organizations respectively in those locations. How many organizations in those locations received HUD McKinney funds?

ANSWER: Over the past 4 years, HUD McKinney Act funds, totaling more than $1.5 million, went to 27 organizations in Baltimore City. Specifically, 22 nonprofit organizations received funds from Baltimore City's allocation of Emergency Shelter Grant funds. During the last four funding rounds of Transitional Housing, three grants were awarded, by a competitive process, to three nonprofit organizations in Baltimore. Through the State of Maryland, two nonprofit organizations received Permanent Housing for the Handicapped Homeless grants. There are no organizations receiving HUD McKinney Act funds in Allegany County.

SENATOR MIKULSKI: Do you agree that the outlays for some of these programs seem low relative to the appropriations after four years of funding?

ANSWER: No. A few years ago outlays were slow, but, as expertise was gained, grantees improved their spending schedules. Moreover, we expect continued improvement as CPD Field staff provide technical assistance to grantees in this area. Outlays, as defined below, for various HUD McKinney Act programs reflect the unique program design features of each program, including different allocation procedures, activity mixes and short- and long-term funding of projects. Thus, the normal outlay schedule for one program may vary significantly from another program. The normal amount of time for any year's appropriation to be spent can vary from 3 years, under the Emergency Shelter Grants program, to 7 years or longer under the SAFAH and Transitional Housing programs, and up to 11 years under the Section 8-SRO program.

For example, the Emergency Shelter Grants program is a formula grant program to States and cities and counties that requires approximately 3 years to expend most of its funds. In most years, HUD is able to allocate and obligate all of its funds to these grantees within 90 to 120 days of the enactment of an appropriation. Once the State and formula grantees have executed a contract for HUD funds, they in turn must obligate these funds. In the case of States, funds are awarded to their local governments or with the approval of the local government, directly to nonprofit sponsors. Then, these State recipients must get funds obligated within 180 days of the State award.

Formula cities must obligate their funds within 180 days of receiving a grant from HUD. HUD recently issued a new regulation requiring that formula cities and counties draw down all funds within 2 years of their grant approval. State ESG recipients must draw down their funds within 2 years of receiving their grant from the State.

In contrast to the ESG program, the SAFAH and Transitional Housing programs take approximately 7 months after appropriation to solicit, rank and rate, and sign a grant agreement with recipients. Many of the grant awards involve acquisition and rehabilitation activities taking up to a year, followed by 5 years funding of operating and supportive services for the project. Thus, it may take as long as 7 years after the appropriation for all of the funds to be spent. The Permanent Housing program with acquisition and rehabilitation activities followed by 2 years funding of operating and supportive services may have a 4 year spending cycle. In the Section 8 SRO program, the funds are awarded in a National competition and reserved about 1 year after the appropriation. The vouchers for this assistance are provided for a ten year period.

At this point we are closely monitoring the progress of grant recipients in all of HUD's McKinney programs. We are providing technical assistance to those grantees that are experiencing difficulties, and, as a last resort, deobligating funds of those who clearly are unable to execute their grant agreements. Of course when we deobligate funds, the final date for expending that appropriation is delayed as the deobligated funds are recycled though the funding process and potentially committed to another multi year project.

SENATOR MIKULSKI: When do you consider an outlay to have taken place (1) when you set up a letter of credit for the recipient to draw on? (2) when the recipient (who may not be the shelter) makes the funds available to a shelter? (3) when actual disbursements such as contract payments are made?

ANSWER: Outlays represent disbursements of funds from the grant recipient's letter of credit. Grant recipients for the Emergency Shelter Grants program are States and formula cities and counties; for the SAFAH and Transitional Housing programs, States, other governmental units, tribes, and nonprofit sponsors are recipients; and for the Permanent Housing for the Handicapped Homeless, States are recipients. This means that outlays represent draw downs (expenditures) for goods and services purchased to serve homeless persons, the third case described in the question.

SENATOR MIKULSKI: GAO has reported that many of the Comprehensive Homeless Assistance Plans (CHAPs) it reviewed (those initially submitted) seemed too vague to result in direction of funds toward those areas most in need. One of the values of the CHAPs would seem to be to identify gaps in a community's homeless effort, e.g., that more funds are needed for say, homeless mentally ill, or for a shelter in a certain part of town. Have the submissions been any different? Have HUD's criteria for CHAP approval been made more stringent?

ANSWER: We agree with the GAO analysis of the first CHAPs. We have seen improvement in the second CHAP submission (February 1989). However, both of these CHAPs were prepared under severe time constraints.

HUD's review of these initial CHAPs revealed that their quality and comprehensiveness varied widely. HUD recently proposed changes in the CHAP (Federal Register, March 13, 1990) with a primary goal of making the CHAP a more useful planning and coordinating mechanism at the State and local level. The proposed rule requires States and localities to provide standard and reliable data in their annual CHAPs on the number and characteristics of the homeless populations within their jurisdictions, a more detailed and standardized inventory of homeless facilities and services, and an expanded needs/resources strategy. Many of the proposed requirements stem from HUD's review of CHAPs it considered to be effective, or from items of information that jurisdictions have concluded to be essential and which are already being provided in many CHAPs. The preamble to the proposed rule contains an extended discussion of HUD's analysis of previous CHAP submissions and the rationale for the proposed changes. HUD is now assessing comments it has received from States and local governments concerning the proposed new requirements and will soon propose a new schedule for implementing these changes.

SENATOR MIKULSKI: HUD recently placed three of its four McKinney Act programs within one office in CPD. Has staff continuity been a problem?

ANSWER: Gains in ability to coordinate the programs, to concentrate expertise, and to provide technical assistance to applicants through a very active CPD Field staff far outweigh any loss of continuity.

In reality, staff continuity has been a very minor problem. The new office has many of the same people who worked on HUD McKinney Act programs before the consolidation. In the newly created Office of Special Needs Assistance Programs (SNAPs), one-half of the managers worked on the Emergency Shelter Grants program or the Supportive Housing Demonstration program in the past 3 years; and four of the ten desk officers, who deal with grant administration for SAFAH and Supportive Housing Demonstration recipients now, are from the Housing office which dealt with those recipients prior to the change.

In addition to having staff with a history of administration of these programs, the SNAPs Office also has brought together staff with a greater variety of skills appropriate to solving the homeless problem: an expert in rehabilitation, an expert on social services and runaway youth from HHS, a HUD Field Office employee who provided technical assistance to recipients of Supportive Housing Demonstration grants, and several staff who have spent the past 3 years analyzing HUD McKinney Act programs.

Along with consolidation in Central Office, program administration was consolidated in the Field, providing an advantage to applicants and recipients. CPD Field staff have a history of providing frequent, high quality technical assistance to HUD program recipients. As evidenced by numerous commendations from this year's applicants, the CPD Field staff has given them invaluable guidance. We expect that, as the CPD Field staff's expertise grows, they will become a major part of the initiative to end homelessness.

SENATOR MIKULSKI: Why wasn't the Section 8 SRO program also moved to CPD?

ANSWER: The Section 8 SRO program is essentially an add-on to the existing Section 8 Moderate Rehabilitation program, having the same character, rules, procedures, etc. In fact, the legislation specifies that the Section 8 SRO funds "shall be used only in connection with the moderate rehabilitation of housing described in section 8(n) of the United States Housing Act of 1937 for occupancy by homeless individuals."

To ameliorate the effects of its separation from the other homeless programs, the SNAPs staff and Section 8 SRO program staff work closely together on homelessness issues and policies. Moreover, the Section 8 SRO staff is active in interagency task forces.

SENATOR MIKULSKI: Your budget proposal indicates the SRO Program will be used exclusively for the mentally ill and those with substance problems. Isn't this a new criterion?

ANSWER: The proposal to target the Section 8 SRO program exclusively for mentally ill persons and those with substance abuse problems is new. In the past, recipient communities set priorities among those to be served. However, the chronically mentally ill and persons who are substance abusers are the most difficult to serve, are the most in need of services, and, therefore, were sometimes underserved.

SENATOR MIKULSKI: What assistance is there for the able-bodied then, other than the barracks-type shelters?

ANSWER: Other single individuals are served in a number of ways by the rest of the HUD McKinney Act programs. They may reside temporarily in an emergency shelter while re-establishing their economic independence. (Not all emergency shelters are barracks-style housing.) Single individuals may reside in transitional housing while obtaining the skills--education, job training, life skills--to return to independent living. In many communities, homeless persons in need of improving their skills are referred from emergency shelters to transitional housing.

SENATOR MIKULSKI: I understand HUD is considering changing SRO occupancy from a 12 month lease to a one month lease. Why?

ANSWER: Findings from a recent HUD study of the 30 Section 8 SRO projects funded in fiscal year 1988 indicated that some homeless persons were reluctant to sign a lease for the 1 year minimum (making leasing difficult) and that there was a very high rate of turnover among the homeless SRO residents in spite of the lease requirement. The change to a 1 month lease would, in addition to appearing less intimidating to potential residents, allow sponsors to evict troublesome residents more easily.

SENATOR MIKULSKI: What procedures does HUD and/or the Interagency Council have in place to monitor the recipients of McKinney Act funds for legal and regulatory compliance, and to evaluate the programs' effectiveness?

ANSWER: HUD and the other Federal agencies administering the various McKinney Act programs have the primary responsibility for monitoring grantees' compliance with legal and regulatory requirements.

HUD Field staff are required to perform a risk analysis of all McKinney Act Program grantees within their jurisdiction at the beginning of the fiscal year. This covers Emergency Shelter Grants, Transitional Housing, Permanent Housing for the Handicapped Homeless and Supplemental Assistance for Facilities to Assist the Homeless.

The purpose of the risk analysis is to target on site monitoring to those projects which are most vulnerable. The factors considered are: capacity of the grantee; the size and the complexity of the grant; any known problems. In addition, HUD receives fiscal and programmatic reports which are reviewed by staff to determine if grantees are using program resources appropriately. When on site, Field staff check for at least the following: reasonableness of costs; whether intended beneficiaries are being served; whether the supportive services respond to the population's needs; and whether matching funds are provided.

With respect to evaluations, HUD is undertaking a short term study to gather preliminary information of the results of Transitional Housing and Permanent Housing for the Handicapped Homeless (Supportive Housing Demonstration Program.) HUD intends to follow this effort with a longer term, more in-depth study.

The HUD Office of Policy Development and Research recently (March 1990) submitted a report to Congress on the Mod Rehab SRO projects funded in the first round. The primary funding of the study was that the program appeared to operate effectively and to provide a vital housing alternative for the single homeless at affordable rents averaging close to $300 per month. The study found that the SRO program provided a stable communal environment. Also, the SRO program is administered through Public Housing Agencies which are monitored by the Field Offices for legal and regulatory program compliance.

In accordance with the McKinney Act, the Council will notify the Inspector General of the responsible agency (or head of the agency in the case of an agency which has no Inspector General) if it finds any significant problem, abuse, or deficiency in this area during its monitoring and evaluation efforts.

The Council meets regularly with the agencies administering the McKinney programs to coordinate research and evaluation activities and identify the need for additional program evaluations. Preliminary assessments have been completed already for several of the McKinney programs, and a number of other evaluations are either planned or underway. At the request of the Council, the Inspector General of the Department of Health and Human Services will soon complete a report on State and local perspectives on the McKinney Act's impact on the problem of homelessness and on changes to the Act which would enhance its effectiveness.

In addition, Council staff conduct site visits throughout the year to review the effectiveness of McKinney and other homeless assistance programs. All 10 Federal regions will be visited this Summer in conjunction with this ongoing monitoring program.

SENATOR MIKULSKI: I understand HUD is still unable to award all the funds made available for Permanent Housing for the Handicapped. Have you determined the cause for this?

ANSWER: The Department believes it has corrected the past deficiencies which prevented obligating fully the funds available for the Permanent Housing Program. To overcome these deficiencies, HUD has held workshops and provided technical assistance, through its Field Offices, to applicants and project sponsors. As a consequence of these outreach efforts, we now anticipate obligating all funds this year. Other factors which should contribute to an improved funding process are: revised matching requirements, more time for State governments to organize their staffing and budgetary resources to participate in the program, and an extension of the application preparation period from 60 to 90 days.

In the past there were a number of reasons HUD had difficulty awarding funds for the Permanent Housing Program. These related to a shortage of acceptable applications due to deficiencies in meeting eligibility requirements, matching funds, or project feasibility. However, significant improvements have been made with the passage of the 1988 McKinney Amendments which allow the matching requirement to be met by sources other than the State government and which allow funding of 2 years of operating expenses. Significant improvement was experienced in 1989, with $9,947 thousand being awarded compared to only $6,793 thousand in 1988.

SENATOR MIKULSKI: The Interagency Council's 1989 report is quite comprehensive and interesting. For example, the lack of facilities the government initially made available under Title V caused a lot of criticism, but we see where the Interagency Council is pushing this program. How do you see it going now?

ANSWER: Despite initial difficulties, we believe that we have made significant progress in identifying properties which are potentially available, in increasing awareness of the availability of this property, and in making Title V operate more efficiently.

GSA's fiscal year 1990 inventory includes 376 excess and surplus properties, 248 of which were determined either to be unsuitable or were not requested by homeless providers. Six properties valued at $19 million were established as shelter sites and another 86 properties are in various stages of review by HHS, HUD and GSA. Since the beginning of fiscal year 1989, 28 properties valued at over $52.1 million have been made available for homeless use.

However, we are still concerned about the small number of applications submitted for Title V properties; only 50 or so applications have been submitted to date. Virtually none of the complete applications have been disapproved.

To encourage additional applications, the Council continues to distribute information on Title V through its publications. We are in the process of revising a guide to obtaining real and personal property for widespread distribution, including those on our mailing list of over 30,000 organizations. To further clarify policies and procedures, HUD, GSA, and HHS are developing a joint regulation that will consolidate guidance on the Title V process. HHS is amending the Public Health Service property regulations to clarify that surplus property can be deeded for homeless assistance as well as for other health purposes.

SENATOR MIKULSKI: But you still show only 9 properties transferred as of last November. That apparently doesn't include everything, such as FHA repossessions?

ANSWER: The 9 properties cited in the annual report do not include FHA foreclosed properties. (NOTE: As of May 24, 1990, 28 properties had been transferred under Title V.)

HUD has taken a number of steps to more actively market the FHA single family property disposition program as a tool for use in homeless assistance programs. In January 1990, HUD published a regulation which revised the single family property disposition program to make HUD-acquired properties more readily available to homeless providers. Between 1983 and 1989, 400 of these properties were made available for homeless use. Over 800 properties are currently under lease, double the previous number.

SENATOR MIKULSKI: What caused the initial lack of results?

ANSWER: The Title V process is a complex one, requiring extensive interagency coordination between HUD, HHS, and GSA. There were several specific problems that had to be addressed in getting Title V to run smoothly. First, there was no specific mechanism for notifying potential applicants. Of the approximately 5,000 properties that have been reviewed under Title V since 1987, nearly half have been found suitable. However, there have only been approximately 50 complete applications submitted for these properties to date. (It should be noted that many of the properties are not of interest to homeless providers because of their distance from population centers and for other reasons. Many providers lack the financial resources to make the property suitable for occupancy.) HUD has made organizational changes to place the responsibility for outreach to eligible applicants for Title V'property to Field staff who have contacts with the local governmental and non-profit entities who are most likely to apply. HUD also publishes a weekly list of suitable properties in the Federal Register.

Another initial problem was the need for better information on individual properties and the agencies' plans for them. HUD has redesigned the suitability requirements and has developed a computerized tracking system that is designed to provide more descriptive and timely information.

Finally, the current system for determining suitability and availability can be confusing to potential applicants, since each determination is made separately. The Council is evaluating various options to permit the issuance of a single notice of suitability and availability, thereby eliminating one of the more time-consuming and confusing steps in the Title V process.

SENATOR MIKULSKI: The Council also recommended that federal assistance be streamlined, and we know the tight timeframes under the various McKinney programs has been criticized as reducing the number and quality of project proposals. Has this improved?

ANSWER: Yes. For the fiscal year 1990 funding rounds, the Council encouraged the agencies administering McKinney programs to provide as much time as possible for submission of applications, recognizing at the same time the need to award the funds promptly in order to meet the urgent needs of the homeless. Several McKinney programs allowed longer submission deadlines than in previous years.

To help potential applicants maximize the time available for preparing and submitting their applications, the Council published timetables of the anticipated dates of funding announcements and application deadlines in its "Program Alerts" as soon as the fiscal year 1990 appropriations levels were known. These timetables were updated frequently as additional information became available. To further help improve the quality of applications, HUD, HHS, and other agencies with McKinney funding held technical assistance workshops to assist applicants in developing their applications.

SENATOR MIKULSKI: Your report estimates the homeless population at five to six hundred thousand, which is far lower than other estimates. What is your basis for this?

ANSWER: The Council's estimate was based on a rigorous national study conducted by the Urban Institute for the U.S. Department of Agriculture in 1988. It is generally consistent with estimates in other national studies which used sound methodologies. None of the estimates in these studies comes close to the estimate of three million or more which is often cited in the media.

INDIAN HOUSING

SENATOR MIKULSKI: The National American Indian Housing Council estimates that 25% of all housing units on Indian Reservations, where about 700,000 Indians and Alaska natives reside, are either overcrowded, dilapidated or otherwise substandard. Given this enormous need, why has the Department for the 11th time in 12 years recommended no new Indian Housing units in its budget?

ANSWER: With more than 7,000 units in the Indian Housing preconstruction/construction pipeline, the Department feels that resources can best be used for renovating, rehabilitating and modernizing existing Indian Housing units.

INSPECTOR GENERAL

SENATOR MIKULSKI: Public Law 101-173 will become effective in fiscal year 1991. In your opinion, should authorized uncontrollable overtime be shown as a separate budget line item?

ANSWER: Authorized Uncontrollable Overtime (AUO) is a form of overtime worked by a particular class of employees (OIG Investigators in this case) whose duties require them to work substantial amounts of irregular, unscheduled overtime with the employee generally being responsible for recognizing, without supervision, circumstances which require the employee to remain on duty. Currently, OIG Investigators receive premium pay for AUO based upon a percentage (10 to 25 percent) of the salary rate of the General Schedule grade 10, step 1. This percentage is based on the amount of authorized unscheduled overtime worked in the previous quarter. For fiscal year 1990, AUO premium pay costs are the equivalent of 3.6 staff-years.

Public Law 101-173 substantially alters the basis upon which AUO premium pay will paid. Under the provisions of P.L. 101-173, AUO will be paid on an annual basis at a rate between 10 and 25 percent of the basic pay for the position rather than a percentage of the rate paid at the GS-10, step 1.

In our opinion, AUO should be highlighted within an OIG's budget request. We feel very strongly about this due to the substantial impact AUO has had in 1990 on our ability to fund personal services and achieve our authorized personnel ceiling.

AUO premium pay is presently combined with regular overtime paid to noninvestigative OIG employees, however, staff-year equivalents for AUO are not identified. The combining of regular overtime and AUO into one account makes it very difficult to separate out the costs associated with each and to budget accordingly. Based on our current costs for overtime, we estimate that AUO represents about 96 percent of this amount. Translated into staff-year usage, AUO premium pay will cost the OIG the equivalent of 3.6 staff-years during 1990. Because these staff-years are not accounted for, the cost of AUO premium pay impacts significantly on our ability to reach the staffing level authorized by Congress. In contrast, regular overtime for 1990, as reflected in our appropriation request, was estimated at 0.3 staff-year. Our regular overtime staff-year usage in 1990 is actually running considerably less then this amount.

The Office of Inspector General has raised this issue with the HUD Office of Budget and together we are working to modify staff-year usage reports to reflect AUO staff-years. This would enable us to more accurately portray AUO premium pay costs, estimate AUO staff-year equivalency, and achieve Congressionally authorized personnel ceilings. This has become even more important with the passage of P.L. 101-173 which authorizes payment of AUO at higher rates of pay than previously allowed.

GENERAL HOUSING QUESTIONS

SENATOR MIKULSKI: What is the Department's estimate of the number of "net new incremental" units which will be added to the supply of low income housing?

ANSWER: The 1991 Budget reflects a proposed program level of 82,049 incremental unit reservations. The incremental units are distributed among the program components as follows:

Program	Incremental Units
Section 8/202 Elderly:	
New Construction.........	3,097
Leased..................	1,700
Section 202(h) Handicapped:	
New Construction.........	870
Leased..................	1,300
Vouchers:	
Incremental.............	43,038
Pub. Hsg. Homeownership..	1,886
Pub. Hsg. Transitional...	3,000
Homeownership/Prepayment...	6,250
Property Disposition.......	5,000
Certificates:	
Incremental.............	6,889
Homeownership/Replace....	1,114
Moderate Rehabilitation SRO	1,305
Subtotal................	75,449
Homeless units a/..........	6,600
Total....................	82,049

a/ Administered by Community, Planning and Development

SENATOR MIKULSKI: There are one million families on public housing waiting lists nationwide. Eight hundred thousand low-income families and seniors are on Section 8 waiting lists.

Given this demand, why is HUD proposing to target so much of new voucher money to those already in assisted housing? (i.e., public housing residents, who live in an affordable unit, would receive Section 8 assistance to buy that affordable unit).

ANSWER: Under the Administration's 1991 proposal, the overwhelming portion of the amount requested for vouchers in 1991 is to be targeted to rental housing assistance. Of the $1.56 billion requested for voucher assistance, $1.28 billion--representing 43,038 units--will be for incremental vouchers. Only about $142 million (approximately 9 percent of the total) will be for public housing homeownership assistance.

Even the units available for homeownership assistance can also serve the rental market in several ways. The vacant units offered for sale also will be available to those families on waiting lists for rental accommodations. Tenants choosing not to purchase units can use voucher and certificate assistance to remain in ownership projects as renters or use their rental assistance in other accommodations of thier choosing.

SENATOR MIKULSKI: Why does the Department propose targeting vouchers and certificates to particular special needs groups, such as chronically mentally ill homeless and substance abusers? What about homeless families, battered spouses and their children, and migrant farmworkers, who are also homeless and with special needs? Shouldn't the allocation of homeless assistance to special needs be the locality's to make, rather than HUD?

ANSWER: The Department has proposed the Shelter Plus Care Program to provide housing assistance, linked with services for the chronically homeless. These individuals who are generally severely mentally ill or have chronic problems with alcohol or other drugs are not well served by the current McKinney Act programs. Flexible forms of housing assistance matched with needed support services all tailored to meet the changing needs of these people will be provided. Housing families and subgroups of homeless people will still be served by the McKinney Act programs--including the Emergency Shelter Grants and Supportive Housing programs. President Bush has requested full funding of the McKinney Act programs to ensure that these groups are also served.

We believe that targeting assistance to the chronically homeless, if fact, mirrors local needs because about two-thirds of all homeless are either severely mentally ill, substance abusers or both.

ONE-FOR-ONE REPLACEMENT FOR PUBLIC HOUSING

SENATOR MIKULSKI: The Department is proposing a major change in the replacement assistance for public housing units demolished or sold to residents. HUD, in some cases, proposes using a 5-year voucher to replace a permanently affordable public housing unit.

In addition, HUD would not provide a 15-year certificate as replacement of the lost public housing unit in those situations where the tenant owners agreed to resale restrictions limiting resale to other low-income persons.

Current law requires lost units be replaced with new "hard" public housing units, or, at a minimum, with 15-year project-based Section 8 certificates. Why is the Department walking away from that commitment?

ANSWER: The Department continues to be committed to replacing demolished or sold public housing units. The change is to replace these units with 5-year certificates or vouchers. Since it is the Administration's policy to renew all expiring certificates and housing vouchers, the 5-year certificates and housing vouchers issued to replace demolished or sold units are in effect at least equivalent to 15-year certificates. In addition, Public Housing Agencies have the option to use up to 15 percent of their certificate funding for project-based assistance should they determine a need for "hard" units.

RESIDENT MANAGEMENT AND OWNERSHIP OF PUBLIC AND ASSISTED HOUSING

The budget proposes "monetarizing" 10 years worth of a voucher to enable low income renters to purchase PHA foreclosed apartments. It provides limited 15 year certificates as replacements for public housing units sold to tenants and also provides five year vouchers to public housing tenants not wanting to purchase, who must leave the project and find someplace else to live.

SENATOR MIKULSKI: Why, when everything else in the HUD budget is being shortened to five years, are you proposing to lengthen vouchers to ten years for those already in assisted housing? Isn't this a very costly way to demonstrate the benefits of low income homeownership?

ANSWER: The Department did not propose that vouchers be provided for a 10-year period to enable low-income renters to purchase FHA foreclosed projects. Instead, a homeownership development under preservation (i.e., to avoid prepayments) may receive a grant not to exceed the present value of 10-years worth of Fair Market Rents, "upfront", as a grant to resident management organizations or non-profit and community-based housing development organizations. For all three variants of HOPE grants, the Administration's proposal states only that the Secretary may establish cost limits on eligible activities under this Subtitle. In regard to FHA distressed properties, the grants can be used for rehabilitation, acquisition, technical assistance, capital reserves, security and mortgage assistance. We do not feel that this approach, when combined with matching funds, is a costly method of enabling low-income families to purchase homes.

SENATOR MIKULSKI: What is the total estimated outlay impact of "monetarizing" ten years worth of vouchers to purchase apartments in the Secretary-held inventory?

ANSWER: The proposal to offer the present value of 10-years worth of FMRs to tenant groups for homeownership is one part of a three-pronged preservation/prepayment strategy. Also included in the strategy are the use of Section 8 rental assistance (i.e., LMSA) as incentive to forestall mortgage prepayment and vouchers to protect tenants in case of prepayment. On a natural average basis, the ten-year value of FMRs is just under $60,000 and therefore this would be the maximum outlay impact per unit for a homeownership program. This cost would be incurred on a one-time basis at the time of transfer of ownership. However, the HOPE preservation initiative was proposed as a "package" of alternatives—with actual use of each component to be determined on a case-by-case basis. As a result, separate outlay estimates were not developed for each of the three components. The 1991-1995 outlay impact of the program was determined on an average basis for the entire proposal, as follows:

	1991	1992	1993	1994	1995	Total 1991-95
			(Dollars in Millions)			
Budget Authority....	$412	$317	$345	$376	$492	$1,942
Outlays.............	41	114	180	252	339	927

PUBLIC HOUSING HOMEOWNERSHIP/HOPE

SENATOR MIKULSKI: Lower income persons, by definition, must have incomes below 50 percent of the area median income for the area in which they live. The average annual income of Public Housing households is $6,500. What is the Department's estimate of the number of lower income Public Housing households who will be able to participate in the "HOPE" homeownership proposal with respect to Public Housing in FY '91?

ANSWER: With full funding of HOPE, the Department estimates that up to 4,000 lower-income Public Housing households will be able to participate in homeownership in fiscal year 1991.

SENATOR MIKULSKI: What is the estimated income range of those expected to participate?

ANSWER: The range of incomes will vary depending on the characteristics of each development, the terms of conditions of each sale, and whether any post-sale subsidy will be available. A post-sale subsidy will be provided only where self-sufficiency plans are in place to ensure the income enhancement necessary to eliminate the need for subsidy within 5 years.

SENATOR MIKULSKI: What is the income range of the tenants currently participating in Resident Management Corporations cited by the Secretary in Boston, St. Louis and Washington, DC?

ANSWER: From data that readily are available, the estimated annual incomes average $6,200 at Cochran Gardens RMC in St. Louis, $7,000 at Carr Square RMC in St. Louis, $11,636 at Bromley RMC in Boston, $11,715 at Heath RMC in Boston, and range from $8,500 to $12,500 at Kenilworth-Parkside in Washington, DC.

SENATOR MIKULSKI: What is the total dollar subsidy, including modernization of the unit, post-sale subsidy, and any other operating subsidy from HUD on a per unit basis of this homeownership proposal?

Please compare these costs, dollar-for-dollar, with the GAO's estimate of Kenilworth-Parkside, which could run as high as $74,000 a unit, more than it costs to build a new unit of Public Housing.

ANSWER: The total HUD cost of the homeownership proposal is estimated to be between $37,000 and $46,000 per unit compared with an estimated current cost to HUD of $42,000 per unit as shown in the following table.

	ESTIMATED COST PER UNIT
HUD COSTS WITHOUT HOMEOWNERSHIP	
Rehabilitation	$27,000
Operating Subsidies over 5 Years	10,000
Capital Replacement Reserves	5,000
Total, HUD Cost	42,000
HOPE PROGRAM -- PUBLIC HOUSING HOMEOWNERSHIP	
Rehabilitation	18,000- 27,000 a/
Operating Subsidies over 5 Years	10,000
Capital Replacement Reserves	5,000 a/
Economic Development, Training, Counseling, Architectural and Engineering Work	4,000
Total, HOPE Program	37,000- 46,000 b/

a/ HOPE funds are matched by $1 of State and local funds to each $2 of Federal funds. Selected localities may choose to use Modernization funds for rehabilitation thus permitting costs of $27,000 per unit.

b/ Total HUD costs will vary depending on use of unmatched Modernization funds.

It should be noted that the General Accounting Office (GAO) estimate of $73,806 per unit for Modernization at Kenilworth-Parkside is flawed since it is based on funds approved to date and assumes the rehabilitation of only 341 out of 464 existing units. This would be excessive and not approvable under HUD policies. The District of Columbia will pay for the modernization of the rest of the units. The average HUD unit cost should be based on all 464 units since it was on this basis that approval was given. The average HUD cost is $59,000 per unit. In addition, the estimates are atypical because the Washington, DC PHA is one of HUD's most troubled PHAs with inefficient Modernization processing. This (and not Kenilworth-Parkside homeownership) largely is responsible to the extent Kenilworth-Parkside's rehabilitation appears to be costly. Consequently, the rehabilitation costs projected for Kenilworth-Parkside are not indicative of costs of other existing homeownership projects or future anticipated conversions.

The Administration's HOPE proposal would continue to permit the Modernization of homeownership projects prior to their sale. Modernization maximum cost prototypes for major cities range from a low of $51,563 in Atlanta to a high of $84,700 in San Francisco. Under Modernization, PHAs may request waivers to expend further sums for health and safety items such as lead-based paint abatement or asbestos removal. The prototype cost represents a maximum in the community for standard "hard" and "soft" costs whether for Public Housing, rental or homeownership programs. The Department anticipates that homeownership conversion needs for rehabilitation will vary widely. Some will require extensive rehabilitation while others will require a minimal amount.

For purposes of the fiscal year 1991 Budget, the Department has assumed an average HOPE modernization cost of $18,000-27,000 per unit depending on matching resources available. Selected other costs such as post-sale subsidies and capital replacement reserves will add approximately $15,000 per unit over the 5-year transition period.

More importantly, these homeownership costs will be equal to or lower than costs that would have been paid under the current Public Housing rental programs.

In the short run, homeownership-specific costs such as training, economic development, counseling, and feasibility studies will be offset largely by cost savings from increases in operating efficiency and/or local matching resources. In the long-run, even if initial homeownership costs exceed savings, Public Housing expenditures will be reduced significantly compared with the current rental program because of the elimination of long-term Public Housing costs and resident empowerment which will result in substantial social welfare subsidy savings.

SENATOR MIKULSKI: If, after sale of a Public Housing project or a FHA-foreclosed apartment building to low-income tenants, the tenants are unable to afford the debt service, operating costs, repairs and maintenance, and the tenants either abandon the building or declare bankruptcy, what will be HUD's responsibility in that situation? The local government's?

ANSWER: In accordance with the recommendation of the GAO, the Department has proposed that a right to cure a default before foreclosure be given by any lender to a PHA, RMC, or other appropriate entity in connection with Public Housing sold under the HOPE program.

Similarly, in connection with default of a FHA multifamily building under HOPE, the Department may require that the property be used by the purchaser or its successor(s) and assigns a project only in accordance with the approved homeownership program.

These provisions will serve as safeguards against the loss of property from its approved low-income homeownership use.

SENATOR MIKULSKI: How long do you anticipate it would take from the time a tenant-group first requests funds for conversion to homeownership, and when the units would actually be ready for occupancy?

ANSWER: The length of time between request for homeownership conversion and purchase and occupancy will vary depending on the need and extent of any necessary rehabilitation and temporary relocation, complexity and timeliness of financial processing, local permit requirements, and need for resident home buying counseling and cooperative or association board training, if applicable. While large, multifamily unit development or conversion often are staged, multiyear efforts that sometimes take up to 5 years, single family unit conversion typically is much shorter.

Although the Department cannot provide a single set time standard due to these factors, it is Departmental policy that transfers to individuals from a PHA, RMC or other owning entity occur as quickly as possible consistent with affordability and financing needs. Any holding period by an intermediate group must be well defined, fully justified and acceptable to the resident purchasers. The HOPE legislation also proposes that property to be transferred be in good repair or have a plan to meet housing standards within 3 years of transfer to an eligible family.

SENATOR MIKULSKI: How do these estimates compare with the current demonstration at Kenilworth-Parkside in D.C. and Carr Square in St. Louis? When did they begin their process and are any units yet onwer-occupied?

ANSWER: The efforts at homeownership conversion at Carr Square and Kenilworth-Parkside are consistent with these estimates. A change in rehabilitation funding from tax credit to Modernization funding has necessitated changes to the development schedule at Carr Square. Carr Square first applied for conversion in 1989.

Kenilworth-Parkside received conditional approval for homeownership conversion in October, 1988. It previously had been approved for modernization. Due to delays and mismanagement by the troubled local PHA, the schedule for completion of the modernization is approximately 1-year behind schedule with the first units now projected to be available for occupancy by September 1990.

RESIDENT MANAGEMENT ASSISTANCE

SENATOR MIKULSKI: The HUD budget proposes $5 million of the Public Housing Modernization account be devoted to training and technical assistance to resident management organizations. This is a doubling of the current funding for this purpose. Provide for the record a list of Resident Management Corporations funded with the current $2.5 million, the date of establishment of each RMC and the number of housing units each manages; the types of assistance provided and the name of the provider; and an evaluation of the use of these funds.

ANSWER: Attached is a list of the 37 Resident Management Corporations (RMCs) and the Resident Councils (RCs) that the Department funded from the $2.4 million available in fiscal year 1990 after Appropriation Act reductions and Sequestration. Of the resident organizations that were selected to receive fiscal year 1990 funds, only one organization (Stella Wright RMC in Newark, New Jersey) actually is managing a project. The others are using the funds to obtain training assistance in order to prepare themselves to undertake management responsibilities in the future. Training for resident management typically is a 2-to-5 year process.

The majority of the resident groups that have been funded are Resident Councils that wish to organize as RMCs and receive training in preparation for managing their projects at a future date. The funds for technical assistance are being used to form RMCs, to develop the management capability of newly formed and existing RMCs, to identify and secure funds for supportive services, and to develop business enterprises.

The type of training and technical assistance that will be provided to resident organizations from the 1990 funds will include organization and leadership development, property management, and HUD management and financial requirements. A listing of the service providers is not available at this time because the grantees were selected in April 1990 and are in the process of securing the service providers.

An evaluation of the use of the funds is being performed under contract and a report will be provided to Congress in early 1991 in accordance with Section 122 of the Housing and Community Development (HCD) Act of 1987.

Resident Management Corporations/Resident Councils that Received Fiscal Year 1990 Training and Technical Assistance Grants by State and City

Total-37

STATE	CITY	ORGANIZATION
RESIDENT MANAGEMENT CORPORATIONS (RMCs)		
NJ	Newark	Stella Wright RMC a/ (Established: June 1974)
FL	Tampa	Central Park Village RMC b/ (Established: October 1989)
IL	Chicago	Wentworth RMC b/ (Established: May 3, 1989)
IL	Chicago	4414 S. Cottage Grove RMC b/ (Established: May 3, 1989)
RESIDENT COUNCILS (RCs)		
AK	Anchorage	Parkview Resident Council
AL	Eutaw	Branch Heights Homebuyer Association
AL	Mobile	Resident's Council of Mobile
AZ	Phoenix	Marcos De Niza RC
CA	Harbor City	Normont Terrace Coordinating Committee
CA	Los Angeles	Pico Aliso RAC
CA	Marin City	Marin City Tenants Council
CT	New Haven	Elm Haven Resident Council
FL	Jacksonville	Tenant Advisory Council
FL	Miami	Dade County Overall TAC, Inc.
GA	Atlanta	Carver Homes Tenant Council
IL	Champaign	Burch Village/Dunbar Court RC
IL	Chicago	706 E. 39th Street RC

MO	Kansas City	West Bluff Tenant Association
MS	Greenville	South Delta Regional Housing Authority RC
NC	Charlotte	Resident Advisory Council
NJ	Newark	Stephen Crane Village TA
NJ	Plainfield	Elm-West Tenants Association
NJ	Trenton	Donelly-Page & Wilson H. RC
PA	Philadelphia	Richard Allen Homes TC
PA	Philadelphia	Passyunk Homes Tenant Council
PA	Philadelphia	United Morton Homes RC
SC	Greenville	Tenants On the Move
SC	Greenville	Jesse Jackson Townhouse TA
TN	Memphis	Horton Gardens RA
VA	Alexandria	Alexandria Resident Council
~~VA~~	~~Charlottesville~~	Westhaven Tenant Association
VA	Hampton	North Phoebus RC
VA	Hampton	Pine Chapel Resident Council
VA	Hampton	Lincoln Park Resident Council
VA	Haysi	Centennial Heights Assembly
VA	Petersburg	Pine Oaks Estates RC
WA	Takoma	Salishan Alliance For CS

a/ This RMC is managing 1,336 units for the Newark (NJ) PHA.

b/ This RMC is newly-incorporated and has obtained a non-profit (501c) status and is at the first stage of resident management training.

EVALUATION OF RESIDENT MANAGEMENT ASSISTANCE

SENATOR MIKULSKI: Has the Department conducted an independent evaluation of this fund expenditure? If so, provide for the record. If not, when will such evaluation be completed?

ANSWER: The Department has contracted with ICF to conduct an evaluation of the program pursuant to Section 122 of the 1987 Housing and Community Development Act. The Act requires HUD to conduct an evaluation of resident management (particularly the effect of resident management on living conditions) and submit a report to Congress in early 1991.

SENATOR MIKULSKI: Why has the Department not sought funding for this purpose as part of its Policy Development and Research accounts?

ANSWER: A contract to evaluate resident management training and technical assistance is being funded from the Research and Technology appropriation.

FHA-FORECLOSED PROPERTIES - PROPERTY DISPOSITION

SENATOR MIKULSKI: HUD proposes 5,000 units of "non-incremental" units (vouchers) to enable low income tenants to purchase foreclosed multifamily apartment buildings currently in the "Secretary-held" properties.

What is the average vacancy rate in those foreclosed properties?

ANSWER: At present, HUD has an inventory of 47 projects with about 7,600 units. The vacancy rate varies widely among these projects from 2 percent to 100 percent. An overall vacancy rate is estimated at about 20 percent.

SENATOR MIKULSKI: What is the estimated cost of repair and replacement?

ANSWER: Repair costs for the acquired property inventory ranges from $25,000 to $9 million per property. Keeping in mind that the projects range in size from 4 or 5 units to 600 units per property, repair costs will reflect the size, location, type of construction and condition of the property. Rehab costs could range from $10,000 to $40,000 per unit depending upon the unique characteristics of each project. A reasonable estimate is $20,000 per unit for repairs or $100 million for 5,000 units. Many of the needed repairs will be completed during HUD management of the properties so that potential buyers would not be required to underwrite all of the repair costs.

Estimated replacement costs range from a few hundred thousand to over $9 million per property depending primarily on the size, location, and construction of the properties.

SENATOR MIKULSKI: What is the average age of the buildings?

ANSWER: The buildings range in age from about 8 to 90 years old, with the majority being less than 20 years old.

SENATOR MIKULSKI: What is the average household income of residents living in those foreclosed properties?

ANSWER: The income of residents varies greatly, but averages about $13,000 per year.

SENATOR MIKULSKI: Do the 5,000 non-incremental units mean ten years of "monetarized" vouchers at $60,000 per unit?

ANSWER: The 5,000 units reflect those units anticipated to be purchased. The present value of a 10-year voucher which is estimated at $55,500 per unit would be paid upfront for eligible activities such as acquisition or rehabilitation.

RESIDENT MANAGEMENT AND OWNERSHIP OF PUBLIC AND ASSISTED HOUSING

SENATOR MIKULSKI: If a building is largely vacant, from what waiting list or how will new low income tenants be drawn to purchase these units? Will the "Tenant Preference" requirements of current law (homeless; paying more than 50 percent of their income for rent: displaced) continue for tenant purchasers of the foreclosed units?

ANSWER: Applicants in a tenant purchase could be tenant organizations, other non-profit organizations or public housing agencies. In an application for a tenant purchase, the applicant must submit a plan for identifying and selecting families to participate in the homeownership program. During the interim period before the building is actually sold to the tenants, tenant preference requirements will continue to apply.

Secretary's Task Force on Program Financial Management

SENATOR MIKULSKI: Please provide to the Subcommittee the 28 action plans submitted to the Under Secretary by various task forces within the Department.

ANSWER: The Assistant Secretaries and the Under Secretary are in the process of reviewing the 28 Action Plans developed by the Task Force Working Groups. Several revisions have been made, and others are being considered. As soon as the Under Secretary is satisfied with the Action Plans, they will be submitted to the Secretary for final approval and distribution. Copies will be provided to the Subcommittee at that time.

SENATOR MIKULSKI: What remaining action plans have yet to be submitted to the Under Secretary?

ANSWER: All 28 of the Action Plans have been submitted to the Under Secretary for review.

SENATOR MIKULSKI: When does the Department plan to act on these action plans?

ANSWER: The Working Groups proposed more than 1,000 actions to improve the financial management of the Department. Many of the initiatives in the Action Plans already are underway. Several others are already completed. A number of the recommendations are to correct relatively minor procedural problems and inconsistencies. Others are much more complex and will require time and resources to complete. After the Action Plans have been finalized, the major actions will be tracked in the bi-weekly Secretary's Management Report. The Secretary and Under Secretary will use that vehicle to hold managers accountable for completing actions in a timely manner.

QUESTIONS SUBMITTED BY SENATOR BYRD

COMMUNITY DEVELOPMENT BLOCK GRANTS

SENATOR BYRD: The Community Development Block Grant (CDBG) program is one of the few remaining programs that addresses community development needs. The FY 1991 budget proposes an appropriation of $2,756,000,000, a decrease of approximately $150 million from the amount provided in FY 1990. This would translate into a reduction of approximately $700,000 for the State of West Virginia. The CDBG program has been important in providing States such as West Virginia with the flexibility to design local programs tailored to solving local needs determined through the involvement of the local citizens in the communities. Why is the Department of Housing and Urban Development planning to reduce funding for this program?

ANSWER: The proposed reduction in 1991 funding for CDBG reflects the policy decision to eliminate set asides for two funding categories -- Special Projects and Technical Assistance--which were funded in 1990 under the formerly authorized Secretary's Discretionary Fund. The HUD Reform Act eliminated the Special Projects category and the Department believes direct funding of Technical Assistance is not necessary. Also, the 1991 Budget reflects a policy decision to increase funding support for the disadvantaged in other priority areas, consistent with Departmental goals of providing additional assistance to the homeless and expanding homeowership and affordable housing opportunities.

SENATOR BYRD: In addition to the HUD proposals to reduce the overall funding levels of the CDBG program, I further understand that HUD is proposing to increase the low/moderate income percentage of the program's funding from 60 percent to 75 percent. Proposed changes in the method of counting low- and moderate-income benefit and increased targeting of funds would, I am told, have a significant impact upon the ability to fund public infrastructure (water and sewer) in rural areas, such as those in West Virginia. I am told that communities are currently able to assist these projects with grant funds in order to keep user rates within an affordable range. If communities cannot provide affordable water and sewage disposal, it will adversely impact proposed improvements in providing a suitable living environment, improving the quality of housing, or contributing to economic growth in rural areas. In view of these concerns which have been raised in communications to me, why is the Department proposing to increase the low/moderate income percentage of the program's funding from 60 percent to 75 percent?

ANSWER: The proposal would not adversely affect West Virginia's ability to fund public infrastructure projects in rural areas. Indeed, an examination of the projects West Virginia has funded in the past indicates that this proposal would probably have absolutely no impact on project selection in that State.

The proposal would require that 75 percent of funds be spent on projects that principally benefit people with low- and moderate-incomes. Historically, the preponderance of West Virginia's funding of infrastructure projects has met the low- and moderate-income national objective. For example, 96 percent of West Virginia's funds from their Fiscal Year 1988 grant principally benefitted people with low- and moderate-incomes. This figure exceeds the 60 percent requirement, and it also substantially exceeds the 75 percent proposal.

There appears to be some confusion as to how this proposal would work. For an infrastructure project to meet the objective of providing benefit to people with low- and moderate-incomes, at least 51 percent of the people benefitting from such a project must have low- and moderate-incomes. This is how the Department always has counted benefit, and this proposal would not change this counting procedure. Moreover, this proposal would not require: (1) that at least 75 percent of the beneficiaries of a project have low- and moderate-incomes to meet this national objective or (2) that at least 75 percent of all beneficiaries of CDBG spending have low- and moderate-incomes.

What the proposal would change is the proportion of funds that must be spent on low- and moderate-income benefit projects. Currently, at least 60 percent of grant funds must be spent on projects, at least 51 percent of the beneficiaries of which must have low- and moderate-incomes. The proposal would require that at least 75 percent of grant funds be spent on projects whose beneficiaries principally are those with low- and moderate-incomes.

QUESTIONS SUBMITTED BY SENATOR LEAHY

SECRETARY'S DISCRETIONARY FUND PROJECTS

SENATOR LEAHY: I first want to express my appreciatiion for the active, essential role that the Department has played in the purchase and rehabilitation of the 336 unit Northgate Apartment complex in Burlington, VT by a local non-profit development group. The Northgate tenants, who I know have written to you, are actively involved in this venture.

You may recall that we exchanged several letters on this project, and discussed it by phone two or three times. I am pleased that the Department agrees with me that Northgate is a model for how non-profit developers and committed tenants can work to preserve the tens of thousands of apartments built under the HUD 221(d)(3) and 236 programs that are in danger of being lost to the Nation's affordable housing stock over the next five years.

You were most helpful in expediting HUD processing of applications for assistance from the Northgate development team. Although this talented team of community-based developers brought large commitments of State, local and private funds to this $22 million deal, the remaining large gap in the financing package could only be filled through a Federal investment. This was an opportunity to build a model partnership of State, local and Federal interests.

While appreciating what you and Department staff have done up to now on this, the biggest affordable housing deal in Vermont history, I must point out a matter that concerns me.

Your March 16, 1990 letter to me on the Northgate project states that ". . . a need does not exist for additional Federal funding at this time."

In writing that, you were referring to the Department's disinclination to consider funding Northgate and 37 other projects identified by Congress in the FY 90 appropriations law under the Secretary's CDBG Discretionary Fund.

However, it is my understanding that this project does indeed require an additional Federal investment to meet the modest, cost-effective rehabilitation standards approved by HUD housing program staff in Manchester, Boston and Washington. Northgate's non-profit developers assure me that, all along, HUD staff praised their budget as "tight" and including "no fat".

But I do not intend to take up the Subcommittee's and your time today debating the merits of this specific project, or the general matter of discretionary funding.

I simply want to ask if you're aware that the Senate's version of the FY 90 Supplemental Appropriations Bill--which is in Conference with the House's Bill this afternoon--contains language that takes these discretionary project awards out of report language and puts them in the statute? It is my understanding that the Department would not consider funding projects that were included in report rather than statutory language. This new legislation may soon eliminate the basis for that objection. If that change in the statute is made, can you tell me if the Department will continue to oppose funding Northgate and the 37 other Discretionary Fund projects.

ANSWER: The Department, despite its objection to providing funds to projects in the absence of a competitive process based on need and merit, will abide by the law. If Congress legally mandates that HUD fund its special projects through the Secretary's Discretionary Fund (which was otherwise eliminated as part of the 1989 HUD Reform Act) we will do so, provided the applications meet all necessary statutory and regulatory requirements.

Community Development Block Grants

SENATOR LEAHY: Given all these positives, why is the Administration seeking to further cut the CDBG program? Why pull back on something that really works, especially when more applicants than ever now divide up the funds; when the number of eligible CDBG activities has expanded; and when the CDBG account has 40 percent fewer constant dollars than in 1981?

ANSWER: The proposed reduction in 1991 funding for CDBG reflects the policy decision to eliminate set asides for two funding categories -- Special Projects and Technical Assistance--which were funded in 1990 under the formerly authorized Secretary's Discretionary Fund. The HUD Reform Act eliminated the Special Projects category and the Department believes direct funding of Technical Assistance is not necessary. Also, the 1991 Budget reflects a policy decision to increase funding support for the disadvantaged in other priority areas, consistent with Departmental goals of providing additional assistance to the homeless and expanding homeownership and affordable housing opportunities.

LOW INCOME HOUSING TAX CREDIT

SENATOR LEAHY: You are a well known advocate of using the tax code to achieve social goals, including developing low income housing. I share your view of its importance. Then why does the Administration propose only a one year extension of the Low Income Housing Tax Credit? How is this defensible when there are better alternatiaves to support, like legislation that would make the credit permanent? Will you support such legislation?

ANSWER: The Low Income Housing Tax Credit (LIHTC) is a major budgetary initiative. A one year extension of the credit at the restored $1.25 per capita level represents a $3 billion tax expenditure over time to the Federal Government. The effectiveness and efficiency of the LIHTC needs to be more fully understood before committing to a permanent authorization for a program of this magnitude.

The original authorization for the program in the Tax Reform Act of 1986 was only for 3 years since the program was new and untested. Based upon the success of the credits to encourage the production and preservation of rental housing for low income tenants, the Omnibus Budget Reconciliation Act of 1989 (OBRA) extended the program through December 31, 1990. To better target scarce resources, OBRA included several programmatic changes including provisions to ensure that project allocations would be limited to the amount needed to make a project feasible.

The Administration supports the extension of the LIHTC through 1991 to both continue to provide additional needed low-income housing and to provide a longer period over which to assess its success and effectiveness. As the revised LIHTC is implemented in 1990 and 1991, the question of permanently authorizing the program will be reexamined in light of overall budgetary considerations and other housing initiatives.

For these reasons, I continue to support the 1-year extension of the Low Income Housing Tax Credit in the Administration's HOPE proposal.

SENATOR LEAHY: Do you hear the same thing, that the present system impedes the use of this tax credit that you believe can be so useful? If so, does a one year extension really work?

ANSWER: I believe that the 1-year extension by itself causes no serious problems. Non-profits and developers learned how to work with the Low Income Housing Tax Credit during its initial 3-year authorization and are prepared to continue working with the program. However, the 1989 amendments to the housing credit have created some uncertainty among all participants in the program. Non-profits and developers must adjust to the new extended use requirement, and States must learn how to carry out all their new responsibilities. For these reasons and not because of the 1-year extension, I expected the percentage of funds allocated will be somewhat lower in 1990 than in 1989.

PUBLIC HOUSING HOMEOWNERSHIP/HOPE

SENATOR LEAHY: Finally, I want to comment on your HOPE (Homeownership and Opportunity for People Everywhere) legislative proposal.

First, I want to commend you for putting forward this initiative which is the first serious housing proposal to come out of an Administration in far too many years. There is merit in several of your proposals. I hope that some of them will be adopted in what will be a housing authorization bill that, I assume, will include the best parts of the proposals now on the table.

But I also hope that the Congress will take a long and critical look at the centerpiece of the HOPE plan, which is the emphasis on homeownership for low income people.

You were recently quoted in the Washington Post as saying: "The most universal aspiration of people is to have that white picket fence, that equity in the system, a greater chance to own a piece of property, no matter how humble." I wouldn't for a second disagree with this sentiment in principle, from my family's experience, and that of my consituents in a State where homeownership is tremendously important. But in practice, I think that you go too far with the emphasis on homeownership in your HOPE initiative.

I believe that the tenants at Northgate, the majority of 336 households, share that sentiment, too. However, the present financial reality for them is that even if they were to receive Public Housing for a downpayment and closing costs, most of them would have a very difficult time affording taxes, insurance and maintenance. I wish this were not the case, but it is very real for many low-income Americans who most need affordable rental housing, not ownership that they cannot manage.

I believe that we must provide as many homeownership opportunities as possible. But I believe that it would be folly, and bad social policy, to divert too much of potential funding for rental units into homeownership when our most compelling housing problems today involve not people on the verge of homeownership, but the millions of people on Public Housing waiting lists; living on or close to the streets; and paying inflated prices for rent and utilities that puts them on the edge of homelessness. These are people who are eligible for Federal rental assistance that is too seldom available.

The socially conscious Northgate development team started with the premise that homeownership was a desirable thing. They worked hard to develop a short-term option for homeownership for at least some of the tenants. This could not be achieved--the additional subsidies to support it would have been enormous--but they were able to structure an option for the tenant association to buy the project in 21 years. The financial reality made it impossible to offer homeownership anytime sooner. And it is my considered view that even socially conscious and technically expert developers, in the majority of cases, will encounter similar obstacles as the cost of housing development escalates.

I know of, and admire, the example that you often cite of the remarkable Ms. Kimi Gary and the tenant organization at the Kenilworth-Parkside Public Housing complex in Northeast Washington, D.C. These tenants have made great strides to own and manage their apartments, and to move out of poverty through business development. But I am concerned with reports that cite the very high subsidy per unit--from a variety of public and private sources--that has fueled these positive changes at Kenilworth-Parkside.

Do you believe that this model can be replicated at a reasonable cost elsewhere? With all due respect to the efforts and connections of Ms. Gray, do you believe that Kenilworth-Parkside would be such a model of tenant ownership without deep Federal subsidies, substantial local public dollars, and large sums of foundation and other private grants? In short, what can you cite to convince me that this project is not the extraordinary exception rather than the norm which can be replicated regularly and quickly--since the problem is so great--in Oakland, California and Omaha, Nebraska and Burlington, Vermont? Thank you for your responses to my questions.

ANSWER: Although Kenilworth-Parkside provides a good example of the very real benefits of homeownership, it is not the only model upon which the Department is basing homeownership policy. In addition to Kenilworth-Parkside, 7,901 units had been sold for homeownership as of September 30, 1989 in projects that have used either the Section 5(h) or Turnkey III models. A study by the accounting firm of Laventhol and Horwath has indicated that the Department will save $11 million in subsidy costs that would have been paid over the next 15 years due to the cost effectiveness of the Kenilworth-Parkside homeownership conversion.

In addition to the housing cost savings that can accrue to the Federal Government due to homeownership conversion, important and significant social benefits are gained and economic needs met through the resident management model. This model currently is being replicated at over 100 sites in the nation with assistance from HUD. It is the Department's belief that a good portion of these resident groups also may choose homeownership as they increase their capability to manage their property and improve their lives. Attached is a case study book of various successful forms of low-income homeownership efforts, including several for Public Housing homeownership.

One of the most significant advantages of resident management and homeownership is that it weans Public Housing residents off Federal subsidies rather than perpetuating the present system. The central intent of the resident management and homeownership programs is to empower Public Housing residents to be self-sufficient.

No more money will be provided to Kenilworth-Parkside under homeownership than would be required for rehabilitation and rental subsidies if it remained under the Public Housing rental program. Because post-sale subsidy if phased out under homeownership as self-sufficiency increases, homeownership is less costly to the Federal Government over the long-term.

The resident management movement has shown extraordinary growth in the last several years. From a base of 13 Resident Management Corporations (RMCs) that existed in 1987, over 100 groups now are receiving training assistance and the 13 Resident Management Corporations are under contract to manage all or part of their projects. At a recent convention of the National Association of Resident Management Corporations held in Dallas, over 800 individuals from around the nation representing residents and Public Housing Agencies expressed their interest in this grass-roots movement. As previously indicated, resident management offers only one model of homeownership and there is a growing demand for other forms of homeownership which HOPE would fund. HOPE also is based on the experience gained from other resident management homeownership efforts outside Public Housing such as Northgate in Burlington, Vermont.

HOMEOWNERSHIP AND AFFORDABLE HOUSING: THE OPPORTUNITIES

FEBRUARY 1990

Introduction

The expansion of homeownership and affordable housing is one of the top priorities of the Bush Administration. To achieve this expansion, President Bush, in an address to the National Association of Realtors on November 10, 1989, announced a comprehensive agenda which he called HOPE – Homeownership and Opportunity for People Everywhere. The thrust of HOPE, in addition to increasing homeownership opportunities for low- and moderate-income households, is to create jobs and entrepreneurial activity in the Nation's distressed urban and rural communities.

In his speech, President Bush said in part, "I don't know any better way to revive hope in our inner cities than to give [public housing] tenants themselves a say in running their communities, a stake in the future and the belief that they, too, can own a home. Because the true measure of success isn't how many families we add to housing assistance rolls, it's how many families move up and out and into the ranks of homeowners."

In discussing the HOPE strategy, Department of Housing and Urban Development (HUD) Secretary Kemp stated: "HOPE includes at least ten policy initiatives that together are designed to move the American dream of homeownership and economic opportunity closer to realization for those Americans who have yet to participate fully in the blessings of freedom."

While HOPE seeks to expand homeownership opportunities for low- and moderate-income households, HUD has, over the years, supported homeownership through mortgage insurance and other programs. Many of these programs can contribute to implementation of the HOPE agenda, either through their expansion or by providing valuable lessons that can be applied to the design and implementation of new homeownership programs.

This document includes brief descriptions of HUD programs that have provided homeownership opportunities for low- and moderate-income households. Accompanying the descriptions are one or more examples of successful local efforts, along with backup materials in many instances. The programs are:

- Homeownership Opportunities Using Public Housing Units
    - Public Housing Homeownership Demonstration
    - Section 5(h) Public Housing Homeownership Program
    - Section 21 Resident Management Corporation Homeownership Program
- Turnkey III Homeownership Opportunity Program
- Mutual Help Homeownership Opportunity Program
- Urban Homesteading Program
- HUD-Owned Multifamily Properties
- Community-Based Nonprofit Programs Using CDBG Funds
- Nehemiah Housing Opportunity Program

Homeownership Opportunities Using Public Housing Units

The Secretary of Housing and Urban Development (HUD) was given broad statutory authority to allow Public Housing Authorities (PHAs) to sell public housing projects to lower income residents for homeownership purposes in a 1974 amendment (Section 5(h)) to the United States Housing Act of 1937. Section 5(h) states:

> Notwithstanding any other provision of law, a public housing agency may sell a lower income housing project to its lower income tenants, on such terms and conditions as the agency may determine, without affecting the Secretary's commitment to pay annual contributions with

respect to the project, but such contributions shall not exceed the maximum contributions under subsection (a) of this section.

In 1985 the *Public Housing Homeownership Demonstration*, using the authority contained in Section 5(h), was implemented to test and document a variety of approaches for assisting and encouraging lower income families living in public housing to own their own homes by purchasing their units. Fifteen sites participating in the demonstration have successfully created homeownership programs for their residents, using both single-family and multifamily properties. As of the end of 1989, approximately 320 units had been transferred to public housing residents, and another 360 were scheduled for transfer in early 1990.

After the enactment of the *Section 5(h) Public Housing Homeownership Program*, HUD did not develop any formal guidelines or regulations for its use. (One purpose of the Public Housing Homeownership Demonstration was to provide information on which to base Section 5(h) regulations. These are now in the process of being developed.) However, the Department has approved, on a case-by-case basis, several Section 5(h) applications to sell public housing units to their residents. Under this approach, approximately 3,000 units have been approved and approximately 550 have been sold.

Additional authority was granted HUD to create homeownership opportunities for public housing residents in Section 123 of the Housing and Community Development Act of 1987. Section 123 (incorporated into the Housing Act of 1937 as *Section 21 Resident Management Corporation Homeownership Program*) established a program under which public housing residents and other low-income families may purchase units in public housing projects through a qualifying Resident Management Corporation, which undertakes the ownership, management and maintenance of the property.

Using the authority contained in these statutes, the Department has in the past few years expanded its efforts to provide homeownership opportunities to lower income public housing residents.

Housing and Community Development Agency Baltimore, Maryland

Authority: Public Housing Homeownership Demonstration (Section 5(h)).

Number and Type of Units: The Housing and Community Development Agency (HCDA), which is Baltimore's Public Housing Authority, implemented a program to sell 30 of its more than 2500 scattered-site, single-family properties that are disbursed throughout the city.

Form of Ownership: All units were sold as fee simple ownership.

Eligibility to Purchase: Using a "self-selecting" process, only units whose occupants were income eligible ($10,000 annual income) and desired to purchase were considered.

Sales Price of Units: The average sales price of the units was $23,434 (the appraised value), with an average first mortgage of $18,259. The difference between the sales price and the first mortgage – $5,285 – is held by the HCDA in a silent second mortgage that is forgiven over a 10-year period.

Financing: The modest rehabilitation that was needed – averaging $2,600 per unit – was financed by the HCDA. Mortgage financing for the purchases came from two sources: (1) a State Mortgage Revenue Bond Program that offered 30-year mortgages with a sliding interest rate based on the family's income, and (2) a local Community Reinvestment Act-stimulated mortgage program at 9 percent interest with FHA insurance.

Status: As of December 1989, 28 of the 30 units had been sold to their occupants.

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Program converts renters into buyers

By Rafael Alvarez

Linwood and Jeanette Henry acquired some extra dignity yesterday for the tidy sum of $9.870.

After renting an East Baltimore row house for the last dozen years — a public housing unit subsidized by the federal government — the Henrys are at last going to buy their home.

Home ownership, said Mr. Henry, "Pays off in the long run. It gives dignity, not puffed-up pride, but dignity — something to stand firm on."

One of five city families to take part in a new housing program designed by Baltimore with the help of the federal Department of Housing and Urban Development, the Henrys may even wind up paying less for their mortgage than their $338 monthly rent.

More importantly, Mr. and Mrs. Henry said, after years of getting nothing on their monthly investment but a temporary roof over their heads, they now have something to leave to their children.

"My parents owned their home," said Mr. Henry, a sanitation worker with the city. "And I always wanted one for my kids." Mr. and Mrs. Henry have four children living at home.

> *"Home ownership gives dignity, not puffed-up pride, but dignity — something to stand firm on."*
>
> **LINWOOD HENRY**
> **Buyer of East Baltimore home**

The Henrys and the four other families — purchasing houses for prices up to $27,000 — were welcomed onto the property tax rolls yesterday morning at a City Hall press conference.

After signing their contracts as Mayor William Donald Schaefer looked on, the families were given tool-boxes and tools from the city's housing department.

"You're going to find home ownership makes a difference," the mayor told them. "You'll begin to complain about your neighbors, and we'll tell you — go knock on their door yourself. You're going to be the housing inspectors, the policemen, and the sanitary workers."

The families more than welcomed the new responsibility. Said Dorothy Harris, who will be buying a house in the 400 block of East Lanvale Street that she and her husband have been renting for 13 years: "I've waiting a long time for this."

Mayor Schaefer, along with Marion Pines, director of the Neighborhood Progress Administration, has also waited a long time for such a program.

More than two years ago, HUD placed ads in the *Federal Register* asking cities to apply for a program that would sell a certain amount of public housing units to eligible families.

Eighteen areas qualified, including Indian reservations in Oklahoma, the city of Philadelphia and a

See HOUSING, 3D, Col. 1

HOUSING, from 1D

community in the Virgin Islands.

The requirements for participation in Baltimore's program stated that the family must have an annual income of at least $10.000 (including public assistance if necessary), must have lived in the home for at least three years, and must have $300 for down payment and a good credit rating and public housing rental history.

Before the mortgages were signed, the city weatherized all the homes, fixed items such as leaky pipes or bad floors and sent eligible families to "budget workshops," to educate them about the surprises — such as a leaky roof — that can torpedo a monthly mortgage payment.

"Once you're a homeowner you can't call us up anymore," said Mrs. Pines. "It's your responsibility."

To protect against the possibility that a new homeowner would turn around and sell the property at a profit, the city will hold a second, "soft" mortgage on the property to bridge the gap between the price the low-income family is paying for the house and its appraised value.

For example, if a house being bought for $10,000 is resold for $25,000, the difference will go to the city. The second mortgage expires after 10 years, Mrs. Pines said.

Asked what impact this program might have on available public housing in Baltimore — where an estimated 40,000 households are on the waiting list — Mayor Schaefer said he didn't know, but quickly added that home ownership was his primary concern for city dwellers.

"The federal government (which pays for nearly all public housing) is pulling out of public housing," the mayor said. "I'm personally interested in people owning their own homes. We already have more public housing in Baltimore than all the other (state) subdivisions combined."

Mrs. Pines said after the press conference that 209 vacant city row houses have been scheduled for rehabilitation — properties which may be added to the list of available public housing units.

Reprint of article in The Sun, May 9, 1986, Baltimore, MD.

Newport News Redevelopment and Housing Authority
Newport News, Virginia

Authority: Public Housing Homeownership Demonstration (Section 5 (h)).

Number and Type of Units: The Newport News Redevelopment and Housing Authority (NNRHA) proposed selling all 15 of its scattered-site, single-family units.

Form of Ownership: All units were sold as fee simple ownership.

Eligibility to Purchase: Income eligibility was set at $13,000 per year, although purchasers with incomes ranging from $7,659 to $29,639 – the average being $22,700 – were accepted.

Sales Price of Units: The average sales price of the units was $23,167 (the tax assessment value), with the average first mortgage being $16,712. The difference between the sales price and the first mortgage – $6,455 – is held by the NNRHA in a silent second mortgage that is forgiven over a 5-year period.

Financing: A local minority-owned savings and loan provided financing for all of the units. NNRHA has guaranteed the mortgages for the first five years. Proceeds of the sales are being used to purchase additional housing for the continuation of a homeownership program for lower income households.

Status: The sales of all 15 units were completed in August 1986, one year after program implementation. Thirteen units were sold to the current occupants and two vacant units were sold by lottery to other income-eligible public housing residents.

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1st couple in state buys house in program

NEWPORT NEWS (AP) — A retired couple yesterday became the first Virginia family to buy its public housing house under a new federal program to encourage ownership by poor families.

"In my mind, it's a fantastic thing," said Jesse Corbin, 64, who has been renting the house with his wife, Faye, 49, and their 12-year-old daughter for five years.

Marsha Wulf, a spokeswoman for the Newport News Redevelopment and Housing Authority, said the Corbins are the second couple in the country to take advantage of the program and the first to obtain their mortgage through a private savings and loan institution.

In December, a couple in McKeesport, Pa., bought their public housing home with a loan from the government, said Bill Glavin, a spokesman for the Department of Housing and Urban Development in Washington.

He said other home purchases are in the works in Baltimore and the District of Columbia.

The Corbins signed papers yesterday to buy the house from the Newport News Redevelopment and Housing Authority for $18,397. They financed the purchase with a loan from Community Federal Savings & Loan Association, Ms. Wulf said.

The couple put no money down and the purchase price was figured by how much they could afford, not by the value of the house, Ms. Wulf said.

The Corbins' monthly payments for the mortgage, utilities and insurance will be about the same as their rent, she said.

The three-bedroom, 1½-bathroom house is on a block with other single-family homes, instead of in a public housing project.

"In this block, most of these people have lived here 30, 40, 50 years or more. You really have a lot of stability here," said Corbin, who lives on Social Security and a part-time job as a convenience store manager.

Glavin said 16 communities nationwide are participating in the Public Housing Homeownership Demonstration Program.

"The purpose of it is to enable tenants in public housing to become self-sufficient or be more self-sufficient," he said.

He said only those who have enough income to afford ownership are eligible.

Other communities participating in the demonstration program are Chicago; St. Marys, Md.; Tulsa, Okla.; McKeesport and Reading, Pa.; Lowell, Mass.; Denver; Nashville, Tenn.; Paterson, N.J.; Muskegon Heights and Wyoming, Mich.; and St. Thomas in the Virgin Islands.

Reprint of article in the Richmond Times-Dispatch, May 29, 1986

NNRHA First In Nation To Complete Homeownership Sales

The Newport News Redevelopment and Housing Authority (NNRHA) was the first housing authority in the nation to complete the sale of all properties designated for the federally-sponsored Homeownership Demonstration Program. The last three deeds for Newport News homes available under the U.S. Department of Housing and Urban Development Public Housing Homeownership Demonstration Program were transferred at closings September 26th at Community Federal Savings and Loan, 1512 27th Street, Newport News.

NNRHA sold its first home under this pilot project May 28th of this year to Jessie and Fay Corbin, former public housing residents. September 26 marked the fifteenth and final sale of Homeownership homes, all of which have been privately financed by Community Federal Savings and Loan, a minority-owned firm located in the southeast community. Thirteen homes have been sold to families previously occupying the properties and the selection of families to purchase the remaining homes was made by lottery among participating public housing residents. In all cases, housing has been sold to families who have been public housing residents for at least four years. Sales prices have ranged from $6,856 to $31,200 for the two to four bedroom homes.

Under the Homeownership program the new owners mortgage payment are calculated so that, just as when they were renting from NNRHA, they do not pay more than 30% of their income on total shelter-costs.

HUD's Homeownership Demonstration Program designated approximately 2,000 public housing units nationwide to be sold. September 26th NNRHA became the first out of 18 housing authorities in the nation to complete the program.

Reprint from the NNRHA's News & Neighbors, November 1986

Metropolitan Development and Housing Agency Nashville, Tennessee

Authority: Public Housing Homeownership Demonstration (Section 5(h)).

Number and Type of Units: Three separate developments were proposed to be sold to the residents by the Metropolitan Development and Housing Agency (MDHA): a 48-unit multifamily garden apartment development; 28 units in 14 side-by-side duplexes; and three side-by-side triplexes.

Form of Ownership: The original plan called for the establishment of two cooperatives and one condominium. However, as the residents trained and worked together, they requested that a single limited-equity, scattered-site cooperative be developed – New Editions Community Apartments, Inc.

Eligibility to Purchase: Sufficient income to cover the co-op fee.

Sales Price of Units: Prices of the individual units were based on affordability and varied according to household income and unit size.

Financing: Rehabilitation and transfer costs ($825,000) were paid with Community Development Block Grant (CDBG) funds and were partially recovered from the sale.

The sales price was the appraised value of the property – $1,825,000. Financing of the purchase was covered as follows:

$	25,000	–	purchasing residents – from an escrow account;
$	550,000	–	National Cooperative Bank – 15-year mortgage with a 5-year adjustable rate based on 5-year Treasury notes plus 3 points (used to pay back the CDBG funds);
$	250,000	–	Community Development Office – second mortgage, to be forgiven over 5 years (this represents the balance of the CDBG funds used for the rehabilitation);
$	1,000,000	–	MDHA – third mortgage, to be forgiven over 5 years.

Status: The property was transferred to the resident cooperative in June 1989. Sixty-six units were purchased by their occupants and 10 were marketed to residents of other public housing developments. Eight units are being rented by elderly occupants who did not wish to purchase or to move; Section 8 housing vouchers were provided to these households. One unit is used as an office for the cooperative.

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[REPRINTED FROM HUD'S RECENT RESEARCH RESULTS, DECEMBER 1989]

NASHVILLE PUBLIC HOUSING RESIDENTS BUY COOPERATIVE

Under HUD's Public Housing Homeownership Demonstration, the Metropolitan Development and Housing Agency of Nashville, Tennessee, sold three separate public housing developments to the New Editions Community Apartments Cooperative on June 26, 1989. HUD Secretary Jack Kemp attended a ceremony on July 14 to commemorate the transfer of the property to the residents.

"People want equity and a piece of property they can leave with their children," Secretary Kemp said as he vowed to make it possible for public housing residents across the country to own their own homes. He referred to the Public Housing Homeownership Demonstration as "chapter two of the civil rights movement... First, we had to remove the legal barriers. Now we have to work to provide affordable housing, homeownership programs, and jobs." The significance of this program extends beyond our borders: the United States, Kemp feels, "won't have an ounce of credibility with the rest of the world" unless it helps the public and private sectors work together to make decent housing a reality for all Americans.

Speaking for the homeowners at the ceremony was Rosa Parrish, treasurer of the Cooperative. "It took a lot of courage for me to walk up here before you to speak," said Ms. Parrish, "but my gratitude outweighs my fear. We're little people, and you gave us a chance. I can't tell you the joy and pleasure I've had from being in my little house."

Largest Homeownership Project to Date

The Nashville program is the largest single homeownership project completed to date under the demonstration. It is also the first owner-occupied cooperative in Nashville; these lower income public housing residents are paving the way for future affordable housing in Nashville.

The Cooperative contains 85 units in what were originally three separate housing developments that together comprised a garden apartment complex, several duplex buildings, and three triplexes. The three properties were intended to be sold as two cooperatives and a condominium. But the residents of these developments trained and worked together in forming associations and preparing the bylaws and other rules, and they decided to continue their relationship. They formed one limited equity cooperative containing all three developments.

The prospective home buyers received excellent preparation for the sale through extensive counseling and training programs provided by the housing authority. The programs covered home maintenance, budgeting, responsibilities under a cooperative form of ownership, and duties of the board of directors. Families who wished to purchase their units had to participate in the counseling and training. The Nashville Chapter of the National Urban League and the Cooperative Housing Foundation of Washington, D.C., conducted the counseling and training.

Public and Private Financing Used

The Cooperative was sold to the tenants for $1.8 million, which is the appraised value of the property. The financing of the purchase involved unique arrangements between the public and private sectors that include a $550,000 first mortgage provided by the National Cooperative Bank; a $250,000 silent second mortgage held by the Community Development Office; and a $1,000,000 silent third mortgage covering the balance of the market value of the property held by the housing authority.

The sale price of a unit was based on affordability to the purchasing household. The Cooperative limits housing-related expenses to 30 percent of the household's income. The maintenance and operation fee and cost of utilities are calculated based on a unit's number of bedrooms. That figure is subtracted from the amount representing 30 percent of household income, and the remaining amount is the household's contribution to the "master" or first mortgage on the property.

Of the 85 units in the Cooperative, 74 are presently occupied. Sixty-six families have purchased their units, while eight elderly households who did not desire to purchase rent from the Cooperative using Section 8 housing vouchers. One unit was set aside as a management office, and interviews are being conducted with residents of other Nashville public housing developments who are interested in purchasing the remaining 10 units.

For more information about the Public Housing Homeownership Demonstration, contact Harold D. Williams, (202) 755–5561.

Housing Authority of the City of Paterson
Paterson, New Jersey

Authority: Public Housing Homeownership Demonstration (Section 5(h)).

Number and Type of Units: Brooks-Sloate Terrace is a 242-unit row-house-style development on 23.2 acres that includes 42 buildings: 39 have 4 to 8 units per building, two are boiler houses, and one is a combination boiler house and management office. There are 88 two-bedroom units, 118 three-bedroom units, and 36 four-bedroom units.

Form of Ownership: Limited-equity cooperative.

Eligibility to Purchase: Eligibility income ranges from $9,700 for a two-bedroom unit to $11,500 for a four-bedroom unit.

Sales Price of Units: Individual cooperative shares are priced at $3,500 for a two-bedroom unit, $4,000 for a three-bedroom unit, and $4,500 for a four-bedroom unit. A $500 membership fee (that serves as a down payment) is also required of each purchaser.

Financing: The property will be transferred to the cooperative free of any mortgage debt. Financing of up to 70 percent of the individual share purchases is being provided by the Sixth Avenue Credit Union of New York City with 5-year loans at an interest rate ranging from 11 to 13 percent.

Status: Transfer of the property is planned for March 1990. By the end of 1989, 215 of the residents had paid their membership fee to purchase property. Approximately 20 residents are expected to remain as renters with housing vouchers. Vacant units will be sold to eligible residents of other public housing developments in the city.

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Housing Authority of Louisville
Louisville, Kentucky

Authority: Section 5(h) Public Housing Homeownership Program

Number and Type of Units: The College Courts development, constructed in 1938, consisted of 125 efficiency and one-bedroom units in two-story, walk-up buildings grouped around a courtyard. In 1988 the complex underwent extensive rehabilitation and reconfiguration into 100 one- and two-bedroom units.

Form of Ownership: Condominium.

Eligibility to Purchase: Income eligibility was set at a minimum of $6,000, although the average income of the purchasers has been between $12,000 and $13,000.

Sales Price of Units: The sales price, based on affordability, ranged from $8,000 to $13,700 – roughly $9,000 below the appraised values.

Financing: Rehabilitation of the development cost approximately $3,184,000 and was financed by the following sources:

$	2,000,000	-	HUD's Comprehensive Improvement Assistance Program (CIAP)
$	800,000	-	Housing Authority of Louisville (HAL) operating reserves
$	214,000	-	Community Development Block Grant (CDBG) funds
$	170,000	-	State Energy Conservation Bank

Financing of individual unit purchases was provided by the HAL with 25-year mortgages at 5 percent interest. Proceeds of the sales are being used to develop additional homeownership opportunities for public housing residents.

Status: Ninety-two units have been sold. Title to the remaining eight units is held by the HAL, and they are used to house residents who did not wish to purchase or to relocate.

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COLLEGE COURT--FROM PUBLIC HOUSING TO CONDOMINIUMS

(By Craig Diamond)

In 1938, the Federal government transferred ownership of the newly built College Court Housing Project to the Housing Authority of Louisville, Kentucky. (HAL). As this project approached its fiftieth birthday in 1988, it underwent another more dramatic change in ownership—to its own residents acting together as the College Court Condominium Association. College Court's successful transformation from a half-vacant housing project to a profit making condominium for lower income homeowners demonstrates how community associations can contribute to solving America's seemingly intractable urban housing problems.

Over College Court's fifty years, changes in the population it was meant to house had undermined its usefulness. Because the project's efficiencies and one bedroom apartments no longer matched the size of the families applying for public housing, College Court was suffering vacancy rates of over 50 percent. In addition, 1981 Congressional amendments to the Housing and Development Act required that residents pay rents equal to 30 percent of their income in order to qualify for Department of Housing and Urban Development (HUD) subsidies. In Louisville, the effect was a significant outflow from public housing of those not on welfare, the "working poor." For every one coming into the system who paid over $100 a month in rent, there were five households leaving.

The creation of the College Court Condominium Association addressed these problems. Remodeling College Court's 126 units into 100 larger apartments and selling them to its residents produced a fully utilized asset that gave shelter and equity to a neglected portion of HAL's constituency, as well as a stream of profits to be reinvested in further condominium conversions.

The Housing Authority of Louisville, College Court's landlord and seller, first raised the idea of a condominium conversion with HUD in 1982. With a budget of a little less than $20 million drawn mostly from HUD, HAL manages 6,000 apartments housing approximately 15,000 people or six percent of Louisville's population. Initially, HAL suggested that a 200-unit project be converted into condominiums. But ultimately HUD offered $2 million to remodel the smaller College Court. For its part, HAL contributed $800,000 from its operating reserves, the City of Louisville drew on a Community Development Block Grant to give $214,000; and the State of Kentucky's Energy Conservation Bank supplied $170,000. Altogether, the rehabilitation costs for College Court's 100 new units worked out to be approximately $25,000 per unit.

In order to qualify to buy one of College Court's remodelled apartments, prospective buyers from among HAL's residents had to document annual incomes over $6,000. Since a majority of the tenants in the housing projects operated by HAL are welfare recipients, this was not an unimportant hurdle. In part, College Court itself had been chosen for the program because the 20 percent of its residents who worked was a relatively high percentage for this population and maximized the number of pre-conversion residents going on to become homeowners. College Court's new owners turned out to have a solid $12,000 to $13,000 average annual income from such jobs as day care worker or janitor.

The original prices of College Court's units ranged from $8,000 to $13,700 (roughly $9,000 below their appraised value). HAL acted as the lender and offered a 25-year mortgage at five percent interest. Monthly mortgage payments ranged from $70 to $120; monthly assessments extended from $60 to $100. HAL arranged that each unit contribute $25 monthly to the reserve fund. Overall, the average monthly payment by the new owners was $197—significantly cheaper than the rent most of these people had been paying HAL.

The identification and cultivation of College Court's prospective buyers required careful, sustained attention. Over a third of the HAL residents who applied to the program gave evidence of previously unreported income. On discovering the fraud, HUD insisted these applicants be excluded from any further consideration. Meanwhile, the Mayor of Louisville had demanded that all College Court residents be able to return as renters if they failed to qualify or chose not to buy an apartment. Potentially, this group could have been numerous and might have disturbed the development of effective self governance by the fledgling association. As it happened, the conscientious relocation of those College Court residents continuing to rent minimized the number who chose to return—only eight units had to be rented. At the same time, extensive and thorough marketing among HAL's working residents ensured a sufficient number of buyers—from approximately 300 applications, about 90 were pre-qualified.

The aging apartments themselves required proper attention if they were to be sold. All plumbing and sewer lines were reconstructed to the street. New roofing and flooring, new kitchen appliances, and new bathroom fixtures were installed. As the remodeling progressed, unexpected delays developed. In 1986, the need for asbestos removal swallowed up six months of work. In 1987, there were further delays when newly applied paint peeled off because of excess moisture. The installation of gutters and downspouts and the addition of outer walls in certain areas solved that problem. Throughout this entire process, HAL made a point of keeping its pool of prospective buyers well-informed of the current status of the project.

Today, College Court is a well-established community association with professional management help. Its officers are faced with the usual association irritants of unleashed dogs and unsupervised children. And the association's reserve fund now totals over $40,000.

Since HUD is not asking for a return of its capital, cash from College Court's residents' mortgage payments is being plowed back into more condominiums. Louisville Housing Services, a subsidiary of HAL, has built and sold to current HAL residents thirty-six new condominiums.

The successful development of College Court and subsequent condominiums represents the appearance of a new option for America's cities as they grapple with the ongoing problem of housing their poor. College Court's story suggests that community associations can in fact play a role in addressing this problem.

Craig Diamond is principal researcher for the CAI Research Foundation

Kenilworth-Parkside Resident Management Corporation Department of Public and Assisted Housing Washington, D.C.

Authority: Section 21 Resident Management Corporation Homeownership Program

Number and Type of Units: The Kenilworth-Parkside development consists of 37 two-story garden apartment buildings on approximately 19 acres. The 464 units include 78 two-bedroom units, 207 three-bedroom units, 119 four-bedroom units and 60 five-bedroom units. The property is currently undergoing modernization under the Comprehensive Improvement Assistance Program (CIAP). The Kenilworth-Parkside Resident Management Corporation (KPRMC) has been managing the project since 1982.

Form of Ownership: The KPRMC will operate the development as a limited equity cooperative.

Sales Price of Units: The sales price and need for post-sale subsidy through the Section 8 program is currently under evaluation.

Financing: Since the development will be sold to the KPRMC for $1.00, there will be no financing on the initial purchase. Terms and financing for individual unit sales will be determined.

Status: This sale was conditionally approved by HUD in October 1988. A sales ceremony and signing of the contract of sale between the Department of Public and Assisted Housing and the KPRMC is scheduled for the spring of 1990. Section 8 certificates will be provided to the residents for the first 5 years and tied to a self-sufficiency plan for economic development and job training. A recent study, done by the accounting firm Laventhol & Horwath, of the sale of Kenilworth-Parkside to the RMC estimates a cost saving to the federal government of $6 million after the 10th year, accumulating to $26 million after 40 years.

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The Washington Post Magazine

'THEY CAN'T STOP US NOW'

IT WAS AUTUMN 1986, AND AFTER THREE YEARS OF WAITING, Kimi Gray was about to get her first glimpse of the city's plans to renovate her home. In 1983, the federal Department of Housing and Urban Development had awarded the city a grant to modernize the 464-unit Kenilworth-Parkside public housing complex in Northeast Washington. After dragging its feet for years, the city had hired an architectural firm. But when Kimi and her staff had asked to meet with the firm to explain what they wanted done—as required by HUD—the architects had repeatedly demurred. It wasn't time yet, they said. They weren't ready. Apparently, they did not relish the prospect of planning a major renovation project with a roomful of poor black women.

Finally they had agreed to a meeting. As they unfolded their sketches and presented their plans, Kimi's anger grew. Where were the plans for a new heating plant? What about the underground water pipes that kept bursting? What about the plumbing? These were pretty colored drawings, but they were fluff. They had nothing to do with Kenilworth's real problems.

Michael Price was the first to speak. A decade earlier, Price had been a high school dropout, hanging out on the streets. Kimi had convinced him to go back to school, then sent him to college through her College Here We Come program. Now a professional architect, he was repaying his debt, helping the Resident Management Corp. negotiate the renovation plans.

Price asked about the heating plant, the plumbing, the pipes. "I was shocked, because they knew that half of that stuff I would catch," he says. "I guess they banked on me just letting it ride—being polite and not saying anything. But I got quite angry."

Other residents picked up on his anger. Finally, their board chairman stood up and walked slowly to the front of the room. "No hard feelings against you all," Kimi said, "but your supervisors sent you down here to get your asses kicked. And that's exactly what we're going to do tonight." She proceeded to take apart the drawings in harsh language and great detail. Other residents joined in.

After 45 minutes, Kimi entertained a motion to adjourn. "You just pack up and go home," she told the architects. "We'll deal with it."

And deal with it they did. Kimi went to HUD and demanded that the agency refuse to reimburse the $500,000 the city had already paid the architects. By failing to consult with the tenants, she argued, the architects had broken their contract. HUD agreed, and the city was out $500,000.

Somehow, through it all, things get done. It is easy to exaggerate the accomplishments of Kenilworth-Parkside, and Kimi Gray's supporters have often done so. Kenilworth residents are still poor: Many are single mothers, some are on welfare. Drug use is still widespread. This is still public housing, and though the grass gets cut, it still has that public housing shagginess around the edges. Twenty-five percent of the rent money still goes uncollected. All that said, there is no denying that a remarkable transformation has taken place.

The drug dealers who once used Kenilworth-Parkside as an open-air market are gone.

Teenage pregnancies have fallen.

Residents who once lived with gunfire now walk the project streets in safety. The crime rate has fallen from 12 to 15 reported crimes a month—one of the highest levels in the city—to 2, according to the police.

In the 15 years since Kimi founded College Here We Come, according to her records, more than 600 residents have gone to college. In the previous 15 years, two had.

In 1986, the accounting firm Coopers & Lybrand released an audit of Kenilworth-Parkside. During the four years that Kenilworth had been managed by its tenants, the firm reported, rent collections increased 77 percent—seven times the increase at public housing citywide. Vacancy rates fell from 18 percent—then the citywide average—to 5.4 percent. The Kenilworth-Parkside Resident Management Corp. helped at least 132 residents get off welfare: It hired 10 as staff and 92 to run the businesses it started, while its employment office found training and jobs for 30 more. (Others received part-time jobs.)

Overall, Coopers & Lybrand estimated, four years of resident management had saved the city at least $785,000. If trends continued over the next six years, it would save $3.7 million more. (The federal government would reap additional savings.)

Since the Coopers & Lybrand audit, a complete renovation of Kenilworth has begun under HUD's normal renovation program. (Hence only about 70 units are now occupied; more than 300 families have been temporarily relocated.) The most amazing moment will come next year, if the renovation is completed on schedule: The residents will buy the development from the city for $1. A community of 3,000, once characterized largely by families on welfare, will have become a community of home-owners, the majority of whom work.

It is an incredible story, but not a unique one. Residents in a handful of other public housing complexes around the nation have similar stories to tell. They are testaments to the power of empowerment—vivid demonstrations of what happens when ownership of public services is pulled out of the hands of bureaucrats and put in the hands of those receiving the services. They are living proof that when people are treated as clients for whom decisions must be made, they will learn dependency; but when they are given control over their destinies, they will learn independence.

These stories are also tales of salvation through self-help, rather than salvation through politics. "Self-sufficiency" is the driving theme at Kenilworth-Parkside; one hears the phrase constantly, from all sides. "It's economics, that's what it's all about," says Kimi Gray. "We can talk racism and all this and that, but it's economics. If you got some money, you can buy a lot of this stuff we're talking about begging for, okay?"

Finally, the story of tenant management and tenant ownership is a story of extraordinary political role reversals. Empowerment of poor people was a theme close to the heart of the New Left, carried forward into populist citizens' organizations with fanciful acronyms: ACORN, COPS, BUILD. But in Washington, conservatives like Jack Kemp and Stuart Butler, director of domestic policy studies at the Heritage Foundation, led the charge for tenant management and ownership—and they convinced Ronald Reagan and George Bush to come along.

A complex of 37 low-rise buildings, Kenilworth-Parkside is sandwiched between the Anacostia River and I-295 hard by the Maryland line. It opened in 1959, about the time public housing began its downward spiral. The federal program had been launched during the New Deal as transitional housing for working people who hit hard times. Once constructed, units were not subsidized: Local public housing authorities charged enough rent to cover their operating costs. They screened carefully, and their standards were rigid. Parents had to be married. Many authorities excluded people on welfare. And if residents found better jobs and could afford to move out, they had to.

The program worked well for two decades, but during the boom times of the 1950s, the middle class headed for the suburbs, working families moved out of public housing, and poor migrants from the South poured in. Urban renewal hastened the process: When redevelopment agencies needed to move poor people out of the way of their bulldozers, they pressured the housing authorities to take them—regardless of their incomes, moral standards or presence on the welfare rolls.

Public housing's new residents were poorer; many had trouble coping with life in urban high-rise apartments; and many were black—which often meant they were ignored. Yet as this radically different population moved in, few housing authorities did anything to address its problems.

College Here We Come

KIMI GRAY STARTED ORGANIZING VIRTUALLY THE DAY SHE arrived at Kenilworth-Parkside. She got training and then a job with a federally funded social services organization, working with delinquent youth. (Today, her only income is from her $22,000-a-year job with the D.C. Department of Recreation as a counselor to troubled youth. She receives no salary as Kenilworth board chairman and says she donates all speaking honoraria to College Here We Come.) In the early '70s, she began trying to breathe new life into Kenilworth's moribund residents council. Then in 1974, "Some students came to me and said, 'Miss Kimi, we want to go to college.' What the hell did I know about going to college? Well, I've always worked with young people—always—because they have their dreams, and they're our future. So I said, 'Let me check it out.' "

With help from the local Community Action agency and the city's resident services staff, she gathered information on colleges and financial aid and set up a regular Tuesday meeting with the kids. Soon she and her helpers were tutoring them, bringing in black college graduates to talk, drumming up scholarship money, helping kids find summer and part-time jobs and helping them fill out applications.

With the money from their jobs, the students opened bank accounts. After all the scholarships and loans and work-study jobs had been hustled, if a student still needed $600 or $1,000, College Here We Come kicked in the rest—much of it raised from bake sales and raffles.

To make the program intriguing, Kimi took her students out to play tennis, had birthday parties for them and took them on weekend trips to visit colleges. "That brought about a lot of unity among them," she says, "till it became a family. So we went through the winter and the summer together, and when it was time for our first group to go away, we cried. The hardest job was us departing from one another. When you would go to the bus station, we all would pile in the car."

When kids started actually leaving for college, word spread quickly: "Man, this stuff is real! People really going to college! These children couldn't believe that. Poor people, from public housing, their mothers on welfare, absent fathers, going to college?

"Seventeen kids went to school the first August. That first semester when they came back, we must not have slept for two days. They had so much to tell us. Kids were out West, down South, up North, they were everywhere. They couldn't believe it! They were sharing experiences: 'Well, let me tell you about this!' 'Well, did you know this?' 'Well, it's nothing like this.' "

Nine of the original 17 graduated, and four went on to graduate school. Of the 600 Kimi says have gone to college since, she guesses 75 percent have graduated. (There is no way to independently verify such numbers, and Kimi has been known to exaggerate. But graduates of the program back up the figures.)

Whatever the numbers, College Here We Come is clearly an in thing to do at Kenilworth. Even 16-year-old boys who hang out on street corners look up to those in the program. Every year, Kimi asks graduates to come back and share their experiences with the younger kids. "That's all I ask of 'em: 'Come back and share something. Pass it on.' "

Excerpted from The Washington Post Magazine, July 30, 1989
By David Osborne

Turnkey III
Homeownership Opportunity Program

The Turnkey III program, launched in 1968, is based on an opinion by the HUD General Counsel (relying on general authority found in the U.S. Housing Act of 1937), rather than on a statutory enactment. Between 1968 and 1982, a total of 13,800 units in 165 projects were developed by 72 Public Housing Agencies (PHAs). More than 7,500 of these units have been transferred to homebuyers.

The Turnkey III Homeownership Opportunity Program is a lease-purchase approach to help eligible lower income families purchase homes in certain public housing projects that were specifically developed for homeownership. Although the development of additional Turnkey III units is no longer authorized by the Department, experience gained under this program may be of use to PHAs, resident organizations, nonprofits and others interested in facilitating homeownership opportunities for lower income households.

Winston-Salem Housing Authority
Winston-Salem, North Carolina

Number and Type of Units: The Winston-Salem Housing Authority (WSHA) developed 967 single-family, detached units in seven different projects under the Turnkey III program during 1970-74. The units ranged from three to five bedrooms, reflecting the community's need for housing for large families.

Form of Ownership: Fee simple after a long-term lease-purchase arrangement.

Eligibility to Purchase: Income eligiblility for purchases under the Turnkey III program was compatible with eligibility requirements for the Low Income Public Housing Program; that is, a maximum of 50 percent of area median income. WSHA estimates that incomes at the inception of the program generally ranged between $4,200 and $10,000, while the current range among families that have achieved homeownership is between $20,000 and $23,000.

Sales Price of Units: The sales price of each unit is based on the actual development costs plus any extraordinary rehabilitation that occurs during the term of the lease-purchase agreement.

Financing: The purchase price is amortized by a fixed amount for each month of occupancy during the initial leasing period. Also during the leasing period, purchasing households make a monthly payment of which a portion is credited toward the purchase price of the unit. When the balance of the purchase price reaches a level that can be financed with an affordable mortgage by the purchasing family, WSHA has made arrangements with several private lenders in the area to provide a mortgage.

Status: Of the 967 units developed, 870 had been sold as of September 1989. The typical leasing period for the Winston-Salem program has been 10 years. Notable aspects of WSHA's program are: (1) a strong commitment by the staff; (2) careful screening and selection process; (3) outstanding counseling and training program; (4) a program designed to be part of a larger economic improvement strategy; (5) financing obtained entirely from private lenders; and (6) resident involvement in all aspects of the program

Points of Contact:

Site:	David Thompkins Executive Director Winston-Salem Housing Authority 901 Cleveland Avenue, NE Winston-Salem, NC 27101 (919) 727-8500	
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Mutual Help Homeownership Opportunity Program

The Mutual Help Homeownership Opportunity Program, directed specifically at providing homeownership for lower income Indian households, was implemented by HUD in 1962. Since then, approximately 46,000 units have been developed by Indian Housing Authorities (IHAs), and the titles to approximately 5,000 units have been transferred to Indian families.

The Mutual Help Homeownership Opportunity Program is a lease-purchase program. Homebuyers are required to make a minimum down payment of $1,500 in the form of cash, land, materials or labor. The IHA may build the units in a cluster design or it may allow the homebuyer to place the unit on their own land. Homebuyers may also have input into the design of the unit as determined by the IHA.

Homebuyers sign an agreement called a Mutual Help and Occupancy Agreement with the IHA and agree to perform all maintenance work on the unit. This agreement specifies the homebuyer's obligations over the 25-year term of the contract.

Homebuyer's monthly payments are set by the IHA at between 15 and 30 percent of adjusted income. The minimum payment is an administration charge set by the IHA. If the monthly payment exceeds the IHA's administrative charge for the dwelling, the excess is credited to the participant's equity account and goes toward the puchase of the unit. The IHA owns the unit until actual title is conveyed to the homebuyer when the unit is paid for. At the end of the 25-year agreement, title to the dwelling is transferred to the family.

Northern Pueblos Housing Authority
Pojoaque, New Mexico

Number and Type of Units: The Northern Pueblos Housing Authority administers Mutual Help housing at three sites – Nambe Pueblo, Tesugue Pueblo, and Pojoaque Pueblo – in Northern New Mexico. The three sites contain a total of 550 single-family, scattered-site units.

Form of Ownership: When the 25-year lease-purchase arrangement is complete, the units are transferred fee simple to the residents.

Eligibility to Purchase: Family income must be within lower income limits (below 50 percent of area median income) and be sufficient to meet the costs of homeownership.

Sales Price of Units: The sales price is based on the development cost of the unit and any extraordinary rehabilitation that occurs during the 25-year lease-purchase agreement.

Financing: No individual financing is required. However, each family must make a contribution of land, work, cash, materials or equipment that has a value of at least $1500. Prior to 1987, HUD provided the financing of the development through the sale of project notes. Starting with Fiscal Year 1987, funds for development are made available on a grant basis.

Status: At the end of 1989, 58 units had been transferred to purchasers, with the remaining 492 units under lease-purchase agreements.

Points of Contact:

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HUD

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Housing Authority of the Cherokee Nation of Oklahoma
Tahlequah, Oklahoma

Number and Type of Units: The Housing Authority of the Cherokee Nation of Oklahoma has built more than 3,000 units of housing under the Mutual Help Homeownership Opportunity Program. The units – 3- and 4-bedroom single-family dwellings – are scattered throughout the 14 counties that comprise the service area of the Housing Authority.

Form of Ownership: When the 25-year lease-purchase arrangement is complete, the units are transferred fee simple to the residents.

Eligibility to Purchase: Family income must be within lower income limits (below 50 percent of area median income) and be sufficient to meet the costs of homeownership.

Sales Price of Units: The sales price is based on the development cost of the unit and any extraordinary rehabilitation that occurs during the 25-year lease-purchase agreement.

Financing: No individual financing is required. However, each family must make a contribution of land, work, cash, materials or equipment that has a value of at least $1500. Prior to 1987, HUD provided the financing of the development through the sale of project notes. Starting with Fiscal Year 1987, funds for development are made available on a grant basis.

Status: Approximately 750 units have been transferred to the homebuyers. Each homebuyer receives counseling on taxes, insurance, property law and their responsibilities in the continued maintenance of the unit.

Points of Contact:

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Urban Homesteading Program

In the Housing and Community Development Act of 1974 (Section 810), Congress authorized the Department to transfer repossessed federally owned, vacant one- to four-unit properties to localities for use in HUD-approved urban homesteading programs.

The Urban Homesteading Program was initially implemented by using HUD-held properties to demonstrate the homesteading concept in various communities. Because of the favorable response to the demonstration and the cities' success in selling the units, the program was expanded to include Veterans Administration and Farmers Home Administration properties and encouraged the use of locally owned properties. In 1989, the list of agencies from which communities could acquire properties using Section 810 funds was again expanded to include the Resolution Trust Corporation.

Under the program, homesteaders agree to repair, maintain and occupy the property for a minimum of five consecutive years. The property must meet health and safety standards within one year and must be brought up to local standards for decent, safe, and sanitary housing within three years.

At the end of 1989, more than 120 communities were participating in the Urban Homesteading Program.

Portland Development Commission
Portland, Oregon

Number and Type of Units: The city of Portland has acquired over 171 single-family properties under its Urban Homesteading Program, which began in 1979. The units are scattered throughout 22 neighborhoods.

Form of Ownership: Fee simple title after five years of occupancy.

Eligibility to Purchase: Portland has adopted a strategy of targeting homesteading opportunities to those with income below 80 percent of area median. The average income of the homesteaders has been $14,334.

Sales Price of Units: Homesteaders receive the units free of charge, but must put up $500 to cover taxes and insurance and must obtain financing to cover the cost of the rehabilitation, which has recently averaged approximately $25,000 per unit.

Financing: HUD's Section 312 Rehabilitation Loans are used when funding is available. In addition, the Local Urban Homesteading Agency has made arrangements with a private lender through the leveraging of Community Development Block Grant (CDBG) funds for 20-year, 6 percent loans.

Status: Portland has helped more than 150 families become homeowners. Female-headed households make up 48 percent of the homesteaders and 46 percent are minorities.

Points of Contact:

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John Garrity
Central Office
Office of Community Planning and Development
(202) 755-5324

Department of City Development
Milwaukee, Wisconsin

Number and Type of Units: The city has acquired approximately 636 units for its homesteading program, which began with the HUD demonstration in 1976. The program is targeted to four neighborhoods that are also targets of the city's Community Development Block Grant (CDBG) program.

Form of Ownership: Fee simple title after five years of occupancy.

Eligibility to Purchase: The homesteading program is directed to households with incomes of less than 80 percent of area median income. Average income of current homesteaders is $16,800.

Sales Price of Units: Units are sold to homesteaders for $1.00, plus $500 that goes into an escrow account to cover the cost of insurance for 5 years. In addition, the purchasing family must cover the cost of the rehabilitation, which has been averaging approximately $22,670 per unit.

Financing: HUD Section 312 Rehabilitation Loans are used when funding is available. The city also has a loan program using its CDBG funds.

Status: Approximately 608 units have been homesteaded. Monthly loan payments range between $250 and $300, including escrow accounts for property taxes and insurance. Eighty-six percent of the homesteaders are minorities and 29 percent are female heads of household.

Points of Contact:

Site:
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HUD-Owned Multifamily Properties

It is generally the Department's policy to dispose of HUD-owned multifamily properties (those consisting of five or more living units) through advertised sales at the highest price obtainable in the current market. However, the Department, by statute, may also negotiate a private sale without advertising. A limited number of HUD-owned properties have been disposed of in this manner.

Negotiated sales have almost exclusively been to nonprofit entities for long-term maintenance as low- to moderate-income housing. Some negotiated sales have been to the current residents for conversion to low-income, limited-equity cooperatives.

Methunion Manor Cooperative Corporation
Boston, Massachusetts

Number and Type of Units: This development, built in 1971, consists of four six-story buildings containing 149 units: 19 one-bedroom units, 85 two-bedroom units, 28 three-bedroom units, and 17 four-bedroom units.

Form of Ownership: Cooperative.

Eligibility to Purchase: Eligibility standards to purchase are the same as those set for the Section 8 Housing Assistance Program, since Section 8 assistance is provided to the purchasers.

Sales Price of Units: Membership costs (down payments) are based on the size of unit purchased: $792 for a one-bedroom unit, $950 for a two-bedroom unit, $1,050 for a three-bedroom unit, and $1,134 for a four-bedroom unit. Each purchaser also pays a pro-rata share of the outstanding mortgage.

Financing: The property was sold to the corporation for $12,071, and the corporation assumed the rehabilitation cost of $521,735, financed by a private lending institution. The development has 100 percent Section 8 assistance.

Status: Methunion Manor residents began working toward ownership in 1975 by forming a cooperative and commenced negotiations with HUD on purchase of the development in September 1983. The sale closed on December 4, 1984.

Points of Contact:

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Courtland Wilson
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Multifamily Property
Disposition Division
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Warren Gardens
Roxbury, Massachusetts

Number and Type of Units: This development consists of 228 two- and three-story townhouses, ranging from efficiencies to four-bedroom apartments. The development, located on 16 acres, has 22 efficiencies, 13 one-bedroom units, 180 three-bedroom units, and 12 four-bedroom units. One unit has been set aside for use as an office.

Form of Ownership: Cooperative.

Eligibility to Purchase: Eligibility requirements are based on those set for the Section 8 Housing Assistance Program, and Section 8 assistance is available.

Sales Price of Units: Membership costs (down payments) are based on the size of unit: $679 for an efficiency, $850 for a one-bedroom, $1,280 for a three-bedroom and $1,400 for a four-bedroom. Each purchaser also pays a pro-rata share of the outstanding mortgage. The cooperative offers a down payment loan program to assist new purchasers.

Financing: The financing of the purchase consisted of: $91,700 paid in cash at the closing; a first mortgage of $872,300; and a second mortgage of $1,483,100 held by HUD that is due and payable in 15 years on an unamortized basis. The development has 100 percent Section 8 assistance.

Status: Warren Gardens was built under the Section 221(d)(3) program in 1968, acquired by HUD in 1974 and sold to the Warren Gardens Resident Association in August 1983. During the time HUD held the property, the buildings were rehabilitated.

Points of Contact:

Site:

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Community-Based Nonprofit Programs Using CDBG Funds

The Community Development Block Grant (CDBG) Program provides funds to units of general local governments for a variety of community development activities designed to eliminate slums and blight, assist low- and moderate-income persons, and respond to urgent local needs. CDBG funds may be used by the grantee States and cities to support affordable housing (both homeowner- ship and rental) through:

New construction;
Activities which facilitate and reduce the costs of private development;
Acquisition and conversion of existing structures to housing;
Rehabilitation of existing housing;
Housing payments for owners and renters;
Housing counseling; and
Activities which promote fair housing.

Under certain conditions, grantees may give the CDBG funds to "eligible subrecipients"; (neighborhood-based nonprofit organizations, Section 301 (d) Small Business Investment Companies, and local development corporations) for construction of housing where the subrecipient is undertaking a neighborhood revitalization, community economic development or energy conservation project and the project is necessary or appropriate to achieve the grantee's community development objectives.

Savings represented by the use of CDBG funds in the development of the housing may be passed on to the buyers or renters in the form of lower monthly mortgage or rent payments.

BRIDGE
San Francisco, California

Since its establishment in 1983, BRIDGE has worked actively with local communities and nonprofit housing development corporations to develop housing that can be afforded by lower and moderate income households in the Bay area. By 1988, they had produced more than 3,500 units in eight counties. While the majority of the properties are rental units, several developments are occupied by homeowners.

One of the homeownership projects BRIDGE has worked on is Holloway Terrace. This project was a joint effort with the Housing Conservation and Development Corporation in the development of 42 below market townhomes on a former school site in San Francisco. Condominium ownership was offered for as little as $615 per month for two-bedroom, two-bath homes featuring patios, fireplaces and attached garages. The city provided low-interest bond financing and first-time homebuyer's assistance.

Approximately $420,000 in Community Development Block Grant (CDBG) funds went into the project. The CDBG funds were used for site acquistion, reservation points for the bond financing, site improvements and the construction of a community center.

Points of Contact:

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Director
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HUD:

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Bricklayers and Laborers Non-profit Housing Company, Inc.
Boston, Massachusetts

The Bricklayers and Laborers Non-Profit Housing Company, Inc., a nonprofit development company established by the International Union of Bricklayers and Allied Craftsmen, has been active in the development of affordable housing in the city of Boston. One such project, The Back of the Hill, consists of 165 new homeownership units. Cost of the project was $22,382,074, for which the city's Community Development Block Grant (CDBG) program provided a construction loan of $6,042,000 and a loan for contingencies during construction of $150,000. Remaining financing was provided by the U.S. Trust Company.

Of the 165 units, 49 are reserved for low- and moderate-income families, 58 for households meeting Massachusetts Housing Finance Agency income limits of between 80 and 120 percent of the Boston Metropolitan Statistical Area, and the remaining 58 are for sale at market rate. The low- and moderate-income units are made affordable through the combination of a write-down of construction costs (the CDBG loan has a 1 percent interest rate), city "linkage" funds and the State's Homeownership Opportunity Program, which provides low-interest mortgages to qualified buyers.

Points of Contact:

Site:

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Nehemiah Housing Opportunity Program

The Nehemiah Housing Opportunity Program, established by the Housing and Community Development Act of 1987, has several goals: encourage homeownership by families not otherwise able to afford it; help rebuild depressed areas of cities; create sound and attractive neighborhoods; and increase employment opportunities for residents of these neighborhoods.

Under the Nehemiah Housing Opportunity Program, HUD is authorized to make grants to nonprofit organizations that can then provide loans to families purchasing homes constructed or substantially rehabilitated in accordance with a HUD-approved program. A loan made to a family may not exceed $15,000 and bears no interest. It is secured by a second mortgage held by the Secretary of HUD and is repayable to the Secretary upon sale, lease or transfer of the property.

On October 13, 1989, Secretary Kemp announced the award of $18.9 million in grants to 15 nonprofit orgizations for the development of 1,321 units for homeownership under the Nehemiah Housing Opportunity Program. Since the program is in its early stages, the following example is cited only as an approach that includes all of the elements judged to effectively carry out the intent of the program.

The Enterprise Nehemiah Development, Inc. Baltimore, Maryland

Number and Type of Units: The Enterprise Nehemiah Development, Inc. will construct 283 new units and rehabilitate 17 others. All new construction will be three-story townhouses with three bedrooms, two baths and an unfinished basement.

Form of Ownership: Fee simple

Eligibility to Purchase: Eligible families must have a gross income between $13,000 and $33,000 and a good credit history. They may not currently be homeowners or have owned property within the past 3 years.

Sales Price of Units: Units will be priced at $58,500 plus $4,000 in settlement costs; the estimated cost of development per unit is $78,346.

Financing: Financing of individual purchases comes from a variety of sources:

$	37,500	-	first mortgage loan – State of Maryland
$	14,000	-	second mortgage – Nehemiah Grant*
$	6,250	-	note – city loan**
$	750	-	down payment – buyer**
$	4,000	-	settlement costs – city
$	62,500	-	total

* The total Nehemiah grant for this program is $4.2 million

** These amounts will vary with the income of the buyer

Financial commitments to cover the estimated cost of the program have been made by both public (State of Maryland, $13,533,000; city of Baltimore, $11,948,220 plus land valued at $966,000) and private entities ($2,607,063).

Status: The Nehemiah grant award was announced on October 13, 1989. The city's schedule calls for sale of the units to begin in June 1990, with final sales taking place in June 1992.

Points of Contact:

Site:
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The Enterprise Nehemiah Development, Inc.
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Columbia, MD 21044
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QUESTIONS SUBMITTED BY SENATOR KERREY

CDBG FUNDING REDUCTIONS IN FISCAL YEARS 1990 TO 1991

SENATOR KERREY: Your request for CDBG funding is down although the number of entitlement communities is expected to rise significantly in fiscal year 1991 because of a change in the law. Please provide, for the record, a list of entitlement cities, indicating what they received under the fiscal 1990 appropriation and what they would receive under your fiscal 1991 request. Please indicate the amount which would be available for the small cities portion under the 1990 appropriation and your 1991 request.

ANSWER: The attached lists show the estimated fiscal year 1990 funding and fiscal year 1991 funding for entitlement communities and for small cities under the CDBG program. The estimated allocations are based on the overall amounts for the 2 years as shown within the fiscal year 1991 budget request. Under the fiscal year 1991 request, overall funding would decline 3 percent from $2,817,506,000 to $2,732,765,000. The nonentitlement portion (for States and small cities) accounts for 30 percent of each year's funding and so would also have a 3 percent decline from $845,252,000 to $819,829,000. The overall entitlement amount also would decline 3 percent from $1,972,254,000 to $1,912,936,000; however, since the Budget request shows the fiscal year 1991 entitlement amount is reduced by $27,000,000 to fund Indian Tribes, the amount for metropolitan cities and urban counties would be reduced by 4.4 percent from $1,972,254,000 to $1,885,936,000.

The actual reduction to entitlement communities from fiscal year 1990 to fiscal year 1991 might differ from the amounts shown on the budget request for a number of reasons. First, the final amount for fiscal year 1990 allocation is not clear at this point. Part of the fiscal year 1990 appropriation was to be derived from recaptures from the UDAG program; however, the recaptures were not as great as initially expected. To date, the Department has allocated $2,789,331,000, or approximately 1 percent less than the $2,817,506,000 shown on the fiscal year 1991 budget request. The Supplemental Appropriation (PL 101-302), which was signed by the President on May 25, has the effect of covering part of the shortfall by shifting $14,000,000 from Special Purpose Grants to the entitlement and nonentitlement programs. This legislation and other possible vehicles for additional funding are currently under review in the Department to determine the final fiscal year 1990 funding amount for CDBG.

The fiscal year 1991 reduction might also differ from the amounts shown on the fiscal year 1991 budget if the Indian Tribes are not taken from the entitlement portion only. H.R. 1180, which is currently in Committee, contains language which apparently intends to repeal the requirement to deduct Indian funding from the entitlement portion and to require the Department to fund Indian Tribes out of the total available for CDBG.

Also, the fiscal year 1991 reduction might differ slightly from what is shown on the fiscal year 1991 budget tables based on a small increase in the number of entitlement communities in fiscal year 1991. The fiscal year 1991 Budget indicated that there would be no increase in the number of metropolitan cities or urban counties. Nevertheless, the Department is now in the process of determining eligibility for fiscal year 1991 and currently does expect that there will be an increase of between 10 to 15 metropolitan cities and one urban county, as well as some changes in the configuration of urban counties. Inasmuch as most of the new metropolitan cities are currently funded as part of urban counties, the net effect is expected to be less than a 0.5 percent reduction to fiscal year 1991 allocations.

CDBG STATE & SMALL CITY NONENTITLEMENT
ESTIMATED FY 1990 AND FY 1991
(AMOUNTS IN THOUSANDS OF DOLLARS)

	EST FY 90	EST FY 91
ALABAMA	24618	23878
ALASKA	1528	1482
ARIZONA	5599	5431
ARKANSAS	17588	17059
CALIFORNIA	20957	20327
COLORADO	7643	7413
CONNECTICUT	8927	8659
DELAWARE	1437	1394
FLORIDA	17834	17298
GEORGIA	31070	30136
HAWAII	2289	2220
IDAHO	6318	6128
ILLINOIS	27793	26957
INDIANA	24431	23696
IOWA	20983	20352
KANSAS	13755	13341
KENTUCKY	24607	23867
LOUISIANA	22861	22173
MAINE	9642	9352
MARYLAND	6886	6679
MASSACHUSETTS	23552	22844
MICHIGAN	27012	26200
MINNESOTA	17669	17138
MISSISSIPPI	26614	25814
MISSOURI	20553	19935
MONTANA	5237	5079
NEBRASKA	10139	9834
NEVADA	1284	1245
NEW HAMPSHIRE	5793	5619
NEW JERSEY	7133	6918
NEW MEXICO	8110	7866
NEW YORK	34039	33015
NORTH CAROLINA	36601	35500
NORTH DAKOTA	4513	4377
OHIO	36119	35033
OKLAHOMA	13409	13006
OREGON	8738	8475
PENNSYLVANIA	37258	36137
RHODE ISLAND	3482	3377
SOUTH CAROLINA	22680	21998
SOUTH DAKOTA	5830	5655
TENNESSEE	22645	21964
TEXAS	48769	47301
UTAH	4480	4345
VERMONT	4812	4667
VIRGINIA	18645	18084
WASHINGTON	8482	8227
WEST VIRGINIA	14415	13981
WISCONSIN	21248	20609
WYOMING	2243	2176
PUERTO RICO	46982	45568
*** Total ***	845252	819829

CDBG ESTIMATED FY 1990 AND FY 1991 FOR ENTITLEMENT CITIES AND URBAN COUNTIES (AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
ALABAMA	ANNISTON	606	579
ALABAMA	BESSEMER	662	633
ALABAMA	BIRMINGHAM	6395	6115
ALABAMA	DECATUR	433	414
ALABAMA	DOTHAN	598	572
ALABAMA	FLORENCE	385	368
ALABAMA	GADSDEN	1055	1009
ALABAMA	HUNTSVILLE	1442	1379
ALABAMA	MOBILE	2677	2560
ALABAMA	MONTGOMERY	2514	2404
ALABAMA	TUSCALOOSA	1141	1091
ALABAMA	JEFFERSON COUNTY	2588	2475
ALASKA	ANCHORAGE	1494	1429
ARIZONA	CHANDLER	510	488
ARIZONA	GLENDALE	962	920
ARIZONA	MESA	1675	1602
ARIZONA	PHOENIX	8596	8220
ARIZONA	SCOTTSDALE	584	558
ARIZONA	TEMPE	1017	972
ARIZONA	TUCSON	4261	4075
ARIZONA	MARICOPA COUNTY	2684	2567
ARIZONA	PIMA COUNTY	1741	1665
ARKANSAS	FAYETTEVILLE	414	396
ARKANSAS	FORT SMITH	751	718
ARKANSAS	JACKSONVILLE	229	219
ARKANSAS	LITTLE ROCK	1897	1814
ARKANSAS	NORTH LITTLE ROCK	643	615
ARKANSAS	PINE BLUFF	1019	974
ARKANSAS	SPRINGDALE	226	216
ARKANSAS	TEXARKANA	293	280
ARKANSAS	WEST MEMPHIS	505	483
CALIFORNIA	ALAMEDA	803	768
CALIFORNIA	ALHAMBRA	834	798
CALIFORNIA	ANAHEIM	2186	2090
CALIFORNIA	ANTIOCH	337	322
CALIFORNIA	BAKERSFIELD	1214	1161
CALIFORNIA	BALDWIN PARK	953	911
CALIFORNIA	BELLFLOWER	583	557
CALIFORNIA	BERKELEY	2593	2480
CALIFORNIA	BUENA PARK	614	587
CALIFORNIA	BURBANK	955	913
CALIFORNIA	CARLSBAD	328	314
CALIFORNIA	CARSON	1019	974
CALIFORNIA	CERRITOS	353	338
CALIFORNIA	CHICO	408	390
CALIFORNIA	CHINO	389	372
CALIFORNIA	CHULA VISTA	1161	1110
CALIFORNIA	COMPTON	2064	1974
CALIFORNIA	CONCORD	663	634
CALIFORNIA	COSTA MESA	774	740
CALIFORNIA	DALY	885	846
CALIFORNIA	DAVIS	541	517
CALIFORNIA	DOWNEY	706	675
CALIFORNIA	EL CAJON	776	742
CALIFORNIA	EL MONTE	1821	1741
CALIFORNIA	ESCONDIDO CITY	741	709
CALIFORNIA	FAIRFIELD	519	496
CALIFORNIA	FONTANA	500	478
CALIFORNIA	FOUNTAIN VALLEY	292	279
CALIFORNIA	FREMONT	937	896
CALIFORNIA	FRESNO	3416	3266

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
CALIFORNIA	FULLERTON	897	858
CALIFORNIA	GARDEN GROVE	1253	1198
CALIFORNIA	GLENDALE	1664	1591
CALIFORNIA	HAWTHORNE	730	698
CALIFORNIA	HAYWARD	930	889
CALIFORNIA	HUNTINGTON BEACH	1257	1202
CALIFORNIA	HUNTINGTON PARK	1386	1325
CALIFORNIA	INGLEWOOD	1550	1482
CALIFORNIA	IRVINE	391	374
CALIFORNIA	LAKEWOOD	513	491
CALIFORNIA	LA MESA CITY	407	389
CALIFORNIA	LANCASTER	471	450
CALIFORNIA	LIVERMORE	293	280
CALIFORNIA	LOMPOC	299	286
CALIFORNIA	LONG BEACH	4975	4757
CALIFORNIA	LOS ANGELES	52829	50517
CALIFORNIA	LYNWOOD	1089	1041
CALIFORNIA	MERCED	542	518
CALIFORNIA	MODESTO	1127	1078
CALIFORNIA	MONTEBELLO	759	726
CALIFORNIA	MONTEREY	204	195
CALIFORNIA	MONTEREY PARK	700	669
CALIFORNIA	MORENO VALLEY	444	425
CALIFORNIA	MOUNTAIN VIEW	524	501
CALIFORNIA	NAPA CITY	427	408
CALIFORNIA	NATIONAL CITY	887	848
CALIFORNIA	NEWPORT BEACH	406	388
CALIFORNIA	NORWALK	1161	1110
CALIFORNIA	OAKLAND	7057	6748
CALIFORNIA	OCEANSIDE	983	940
CALIFORNIA	ONTARIO	1091	1043
CALIFORNIA	ORANGE	762	729
CALIFORNIA	OXNARD	1840	1759
CALIFORNIA	PALM SPRINGS	317	303
CALIFORNIA	PALO ALTO	533	510
CALIFORNIA	PASADENA	1614	1543
CALIFORNIA	PICO RIVERA	834	798
CALIFORNIA	POMONA	1527	1460
CALIFORNIA	PORTERVILLE	284	272
CALIFORNIA	RANCHO CUCAMONGA	463	443
CALIFORNIA	REDDING	406	388
CALIFORNIA	REDLANDS	406	388
CALIFORNIA	REDONDO BEACH	498	476
CALIFORNIA	REDWOOD CITY	518	495
CALIFORNIA	RIALTO	388	371
CALIFORNIA	RICHMOND	1051	1005
CALIFORNIA	RIVERSIDE	1837	1757
CALIFORNIA	ROSEVILLE	230	220
CALIFORNIA	SACRAMENTO	3406	3257
CALIFORNIA	SALINAS	1249	1194
CALIFORNIA	SAN BERNADINO	1666	1593
CALIFORNIA	SAN DIEGO	10068	9627
CALIFORNIA	SAN FRANCISCO	16439	15720
CALIFORNIA	SAN JOSE	6358	6080
CALIFORNIA	SAN LEANDRO	603	577
CALIFORNIA	SAN MATEO	590	564
CALIFORNIA	SANTA ANA	3673	3512
CALIFORNIA	SANTA BARBARA	827	791
CALIFORNIA	SANTA CLARA	676	646
CALIFORNIA	SANTA CRUZ	494	472
CALIFORNIA	SANTA MARIA	566	541
CALIFORNIA	SANTA MONICA	941	900

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES'
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
CALIFORNIA	SANTA ROSA	731	699
CALIFORNIA	SANTEE	319	305
CALIFORNIA	SEASIDE	428	409
CALIFORNIA	SIMI VALLEY	533	510
CALIFORNIA	SOUTH GATE	1293	1236
CALIFORNIA	SOUTH SAN FRANCISCO	454	434
CALIFORNIA	STOCKTON	2146	2052
CALIFORNIA	SUNNYVALE	810	775
CALIFORNIA	THOUSAND OAKS	499	477
CALIFORNIA	TORRANCE	884	845
CALIFORNIA	TULARE	343	328
CALIFORNIA	TURLOCK	328	314
CALIFORNIA	UNION CITY	406	388
CALIFORNIA	UPLAND	364	348
CALIFORNIA	VACAVILLE	372	356
CALIFORNIA	VALLEJO	856	819
CALIFORNIA	VENTURA	651	623
CALIFORNIA	VISALIA	521	498
CALIFORNIA	WALNUT CREEK	278	266
CALIFORNIA	WEST COVINA	635	607
CALIFORNIA	WESTMINSTER	633	605
CALIFORNIA	WHITTIER	586	560
CALIFORNIA	WOODLAND	298	285
CALIFORNIA	YUBA	200	191
CALIFORNIA	ALAMEDA COUNTY	1580	1511
CALIFORNIA	CONTRA COSTA COUNTY	2790	2668
CALIFORNIA	FRESNO COUNTY	3658	3498
CALIFORNIA	KERN COUNTY	3946	3773
CALIFORNIA	LOS ANGELES COUNTY	27009	25827
CALIFORNIA	MARIN COUNTY	1456	1392
CALIFORNIA	ORANGE COUNTY	4506	4309
CALIFORNIA	RIVERSIDE COUNTY	5512	[illegible]
CALIFORNIA	SACRAMENTO COUNTY	4349	4159
CALIFORNIA	SAN BERNARDINO COUNTY	4861	4648
CALIFORNIA	SAN DIEGO COUNTY	4638	4435
CALIFORNIA	SAN JOAQUIN COUNTY	2190	2094
CALIFORNIA	SAN MATEO COUNTY	2404	2299
CALIFORNIA	SANTA CLARA COUNTY	2432	2326
CALIFORNIA	SONOMA COUNTY	1986	1899
CALIFORNIA	VENTURA COUNTY	1919	1835
COLORADO	ARVADA	416	398
COLORADO	AURORA	1081	1034
COLORADO	BOULDER	772	738
COLORADO	COLORADO SPRINGS	1943	1858
COLORADO	DENVER	7865	7521
COLORADO	FORT COLLINS	652	623
COLORADO	GREELEY	620	593
COLORADO	LAKEWOOD	617	590
COLORADO	LONGMONT	293	280
COLORADO	LOVELAND	214	205
COLORADO	PUEBLO	1223	1169
COLORADO	WESTMINSTER	350	335
COLORADO	ADAMS COUNTY	1489	1424
CONNECTICUT	BRIDGEPORT	3313	3168
CONNECTICUT	BRISTOL	447	427
CONNECTICUT	DANBURY	511	489
CONNECTICUT	EAST HARTFORD	339	324
CONNECTICUT	FAIRFIELD	441	422
CONNECTICUT	GREENWICH	747	714
CONNECTICUT	HAMDEN TOWN	394	377
CONNECTICUT	HARTFORD	3740	3576
CONNECTICUT	MANCHESTER	383	366

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
CONNECTICUT	MERIDEN	704	673
CONNECTICUT	MIDDLETOWN	389	372
CONNECTICUT	MILFORD	357	341
CONNECTICUT	NEW BRITAIN	1572	1503
CONNECTICUT	NEW HAVEN	3529	3375
CONNECTICUT	NEW LONDON	734	702
CONNECTICUT	NORWALK	816	780
CONNECTICUT	NORWICH	767	733
CONNECTICUT	STAMFORD	1081	1034
CONNECTICUT	STRATFORD	474	453
CONNECTICUT	WATERBURY	1931	1846
CONNECTICUT	WEST HARTFORD	855	818
CONNECTICUT	WEST HAVEN	511	489
DELAWARE	WILMINGTON	2405	2300
DELAWARE	NEW CASTLE COUNTY	2294	2194
D.C.	WASHINGTON	15795	15104
FLORIDA	BOCA RATON	310	296
FLORIDA	BRADENTON	370	354
FLORIDA	CAPE CORAL	250	239
FLORIDA	CLEARWATER	686	656
FLORIDA	COCOA	230	220
FLORIDA	CORAL SPRINGS	250	239
FLORIDA	DAYTONA BEACH	872	834
FLORIDA	DELRAY BEACH	432	413
FLORIDA	FT LAUDERDALE	1973	1887
FLORIDA	FT MYERS	618	591
FLORIDA	FORT PIERCE	703	672
FLORIDA	FORT WALTON BEACH	203	194
FLORIDA	GAINESVILLE	1174	1123
FLORIDA	HIALEAH	3621	3463
FLORIDA	HOLLYWOOD	1039	994
FLORIDA	JACKSONVILLE	6982	6676
FLORIDA	LAKELAND	590	564
FLORIDA	LARGO	387	370
FLORIDA	MELBOURNE	467	447
FLORIDA	MIAMI	11192	10702
FLORIDA	MIAMI BEACH	1788	1710
FLORIDA	NAPLES	118	113
FLORIDA	OCALA	578	553
FLORIDA	ORLANDO	1724	1649
FLORIDA	PANAMA CITY	471	450
FLORIDA	PENSACOLA	780	746
FLORIDA	PLANTATION	261	250
FLORIDA	POMPANO BEACH	844	807
FLORIDA	ST PETERSBURG	2541	2430
FLORIDA	SARASOTA	575	550
FLORIDA	SUNRISE	251	240
FLORIDA	TALLAHASSEE	1417	1355
FLORIDA	TAMPA	3791	3625
FLORIDA	TITUSVILLE	338	323
FLORIDA	WEST PALM BEACH	905	865
FLORIDA	WINTERHAVEN	272	260
FLORIDA	BREVARD COUNTY	1509	1443
FLORIDA	BROWARD COUNTY	4952	4735
FLORIDA	DADE COUNTY	14164	13544
FLORIDA	ESCAMBIA COUNTY	2113	2021
FLORIDA	HILLSBOROUGH COUNTY	3836	3668
FLORIDA	LEE COUNTY	1360	1300
FLORIDA	ORANGE COUNTY	3637	3478
FLORIDA	PALM BEACH COUNTY	4478	4282

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
FLORIDA	PASCO COUNTY	1854	1773
FLORIDA	PINELLAS COUNTY	2515	2405
FLORIDA	POLK COUNTY	3015	2883
FLORIDA	SARASOTA COUNTY	996	952
FLORIDA	SEMINOLE COUNTY	1638	1566
FLORIDA	VOLUSIA COUNTY	2038	1949
GEORGIA	ALBANY	1451	1388
GEORGIA	ATHENS	599	573
GEORGIA	ATLANTA	9094	8696
GEORGIA	AUGUSTA	1709	1634
GEORGIA	COLUMBUS	2170	2075
GEORGIA	MACON	1822	1742
GEORGIA	MARIETTA	352	337
GEORGIA	SAVANNAH	2216	2119
GEORGIA	WARNER ROBINS	382	365
GEORGIA	COBB COUNTY	1802	1723
GEORGIA	DE KALB COUNTY	3387	3239
GEORGIA	FULTON COUNTY	1794	1715
GEORGIA	GWINNETT COUNTY	1380	1320
HAWAII	HONOLULU	10752	10281
IDAHO	BOISE	763	730
ILLINOIS	ARLINGTON HTS	282	270
ILLINOIS	AURORA	811	776
ILLINOIS	BERWYN	1231	1177
ILLINOIS	BLOOMINGTON	571	546
ILLINOIS	CHAMPAIGN	625	598
ILLINOIS	CHICAGO	79069	75609
ILLINOIS	CHICAGO HEIGHTS	471	450
ILLINOIS	CICERO	1572	1503
ILLINOIS	DECATUR	1202	1149
ILLINOIS	DES PLAINES	279	267
ILLINOIS	EAST ST LOUIS	2093	2001
ILLINOIS	ELGIN	644	616
ILLINOIS	EVANSTON	1564	1496
ILLINOIS	JOLIET	1013	969
ILLINOIS	KANKAKEE	552	528
ILLINOIS	MOLINE	692	662
ILLINOIS	MOUNT PROSPECT	233	223
ILLINOIS	NAPERVILLE	239	229
ILLINOIS	NORMAL	327	313
ILLINOIS	NORTH CHICAGO	271	259
ILLINOIS	OAK LAWN	316	302
ILLINOIS	OAK PARK	1446	1383
ILLINOIS	PEKIN	347	332
ILLINOIS	PEORIA	1766	1689
ILLINOIS	RANTOUL	216	207
ILLINOIS	ROCKFORD	1753	1676
ILLINOIS	ROCK ISLAND	1047	1001
ILLINOIS	SCHAUMBURG VILLAGE	247	236
ILLINOIS	SKOKIE	402	384
ILLINOIS	SPRINGFIELD	1213	1160
ILLINOIS	URBANA	400	382
ILLINOIS	WAUKEGAN	711	680
ILLINOIS	COOK COUNTY	9810	9381
ILLINOIS	DU PAGE COUNTY	3073	2939
ILLINOIS	LAKE COUNTY	1900	1817
ILLINOIS	MADISON COUNTY	2652	2536
ILLINOIS	ST CLAIR COUNTY	1775	1697
ILLINOIS	WILL COUNTY	1429	1366
INDIANA	ANDERSON	713	682
INDIANA	BLOOMINGTON	617	590

CDBG ESTIMATED FY 1990 AND FY 1991 FOR ENTITLEMENT CITIES AND URBAN COUNTIES

(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
INDIANA	EAST CHICAGO	1329	1271
INDIANA	ELKHART	619	592
INDIANA	EVANSVILLE	2454	2347
INDIANA	FORT WAYNE	2223	2126
INDIANA	GARY	3358	3211
INDIANA	GOSHEN	222	212
INDIANA	HAMMOND	2065	1975
INDIANA	INDIANAPOLIS	7857	7513
INDIANA	KOKOMO	870	832
INDIANA	LAFAYETTE	635	607
INDIANA	MISHAWAKA	446	426
INDIANA	MUNCIE	1132	1082
INDIANA	NEW ALBANY	612	585
INDIANA	SOUTH BEND	2527	2416
INDIANA	TERRE HAUTE	1735	1659
INDIANA	WEST LAFAYETTE	226	216
INDIANA	LAKE COUNTY	1428	1366
IOWA	CEDAR FALLS	226	216
IOWA	CEDAR RAPIDS	998	954
IOWA	COUNCIL BLUFFS	884	845
IOWA	DAVENPORT	1331	1273
IOWA	DES MOINES	3491	3338
IOWA	DUBUQUE	918	878
IOWA	IOWA CITY	578	553
IOWA	SIOUX CITY	1759	1682
IOWA	WATERLOO	1174	1123
KANSAS	KANSAS CITY	1994	1907
KANSAS	LAWRENCE	585	559
KANSAS	LEAVENWORTH	361	345
KANSAS	OVERLAND PARK	391	374
KANSAS	TOPEKA	1598	1528
KANSAS	WICHITA	2514	2404
KANSAS	JOHNSON COUNTY	1017	972
KENTUCKY	ASHLAND	625	598
KENTUCKY	COVINGTON	1574	1505
KENTUCKY	HOPKINSVILLE	368	352
KENTUCKY	LEXINGTON-FAYETTE	2063	1973
KENTUCKY	LOUISVILLE	8574	8199
KENTUCKY	OWENSBORO	574	549
KENTUCKY	JEFFERSON COUNTY	2541	2430
LOUISIANA	ALEXANDRIA	863	825
LOUISIANA	BATON ROUGE	4114	3934
LOUISIANA	BOSSIER CITY	496	474
LOUISIANA	HOUMA	1254	1199
LOUISIANA	KENNER	670	641
LOUISIANA	LAFAYETTE	1049	1003
LOUISIANA	LAKE CHARLES	908	868
LOUISIANA	MONROE	1061	1015
LOUISIANA	NEW ORLEANS	13553	12960
LOUISIANA	SHREVEPORT	2833	2709
LOUISIANA	SLIDELL	228	218
LOUISIANA	THIBODAUX	211	202
LOUISIANA	JEFFERSON PARISH	3620	3462
MAINE	AUBURN	518	495
MAINE	BANGOR	910	870
MAINE	LEWISTON	833	797
MAINE	PORTLAND	1797	1718
MARYLAND	ANNAPOLIS	362	346
MARYLAND	BALTIMORE	21626	20680
MARYLAND	CUMBERLAND	917	877
MARYLAND	FREDERICK	296	283
MARYLAND	HAGERSTOWN	835	798

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
MARYLAND	ANNE ARUNDEL COUNTY	2046	1956
MARYLAND	BALTIMORE COUNTY	3746	3582
MARYLAND	MONTGOMERY COUNTY	3431	3281
MARYLAND	PRINCE GEORGES COUNTY	5132	4907
MASSACHUSETTS	ARLINGTON	990	947
MASSACHUSETTS	ATTLEBORO	376	360
MASSACHUSETTS	BOSTON	17243	16488
MASSACHUSETTS	BROCKTON	1210	1157
MASSACHUSETTS	BROOKLINE	1190	1138
MASSACHUSETTS	CAMBRIDGE	2794	2672
MASSACHUSETTS	CHICOPEE	968	926
MASSACHUSETTS	FALL RIVER	2482	2373
MASSACHUSETTS	FITCHBURG	988	945
MASSACHUSETTS	FRAMINGHAM	425	406
MASSACHUSETTS	GLOUCESTER	546	522
MASSACHUSETTS	HAVERHILL	933	892
MASSACHUSETTS	HOLYOKE	1319	1261
MASSACHUSETTS	LAWRENCE	1784	1706
MASSACHUSETTS	LEOMINSTER	400	382
MASSACHUSETTS	LOWELL	1879	1797
MASSACHUSETTS	LYNN	2342	2240
MASSACHUSETTS	MALDEN	1250	1195
MASSACHUSETTS	MEDFORD	1412	1350
MASSACHUSETTS	NEW BEDFORD	2525	2414
MASSACHUSETTS	NEWTON	1751	1674
MASSACHUSETTS	NORTHAMPTON	606	579
MASSACHUSETTS	PITTSFIELD	1273	1217
MASSACHUSETTS	QUINCY	1771	1693
MASSACHUSETTS	SALEM	911	871
MASSACHUSETTS	SOMERVILLE	2581	2468
MASSACHUSETTS	SPRINGFIELD	3633	3474
MASSACHUSETTS	WALTHAM	875	837
MASSACHUSETTS	WESTFIELD	333	318
MASSACHUSETTS	WEYMOUTH	555	531
MASSACHUSETTS	WORCESTER	4212	4028
MICHIGAN	ANN ARBOR	1041	995
MICHIGAN	BATTLE CREEK	1224	1170
MICHIGAN	BAY CITY	1242	1188
MICHIGAN	BENTON HARBOR	473	452
MICHIGAN	CLINTON TWP	454	434
MICHIGAN	DEARBORN	1841	1760
MICHIGAN	DEARBORN HEIGHTS	909	869
MICHIGAN	DETROIT	40139	38382
MICHIGAN	EAST LANSING	611	584
MICHIGAN	FARMINGTON HILLS	298	285
MICHIGAN	FLINT	3987	3813
MICHIGAN	GRAND RAPIDS	3222	3081
MICHIGAN	HOLLAND	267	255
MICHIGAN	JACKSON	1295	1238
MICHIGAN	KALAMAZOO	1589	1519
MICHIGAN	LANSING	1501	1435
MICHIGAN	LINCOLN PARK	702	671
MICHIGAN	LIVONIA	449	429
MICHIGAN	MIDLAND	206	197
MICHIGAN	MUSKEGON	993	950
MICHIGAN	MUSKEGON HTS	423	404
MICHIGAN	NORTON SHORES	123	118
MICHIGAN	PONTIAC	1433	1370
MICHIGAN	PORTAGE	187	179
MICHIGAN	PORT HURON	723	691
MICHIGAN	REDFORD	771	737
MICHIGAN	ROSEVILLE	403	385

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
MICHIGAN	ROYAL OAK	1107	1059
MICHIGAN	SAGINAW	2223	2126
MICHIGAN	ST CLAIR SHORES	666	637
MICHIGAN	SOUTHFIELD	358	342
MICHIGAN	STERLING HEIGHTS	529	506
MICHIGAN	TAYLOR	627	600
MICHIGAN	TROY CITY	291	278
MICHIGAN	WARREN	1002	958
MICHIGAN	WATERFORD	368	352
MICHIGAN	WESTLAND	958	916
MICHIGAN	WYOMING	387	370
MICHIGAN	GENESEE COUNTY	2039	1950
MICHIGAN	KENT COUNTY	1262	1207
MICHIGAN	MACOMB COUNTY	1411	1349
MICHIGAN	OAKLAND COUNTY	3228	3087
MICHIGAN	WAYNE COUNTY	3164	3026
MINNESOTA	BLOOMINGTON	373	357
MINNESOTA	BROOKLYN PARK	299	286
MINNESOTA	DULUTH	2506	2396
MINNESOTA	MINNEAPOLIS	11899	11378
MINNESOTA	MOORHEAD	228	218
MINNESOTA	ROCHESTER	394	377
MINNESOTA	ST CLOUD	396	379
MINNESOTA	ST PAUL	6469	6186
MINNESOTA	ANOKA COUNTY	1207	1154
MINNESOTA	DAKOTA COUNTY	1267	1212
MINNESOTA	HENNEPIN COUNTY	2279	2179
MINNESOTA	RAMSEY COUNTY	1056	1010
MISSISSIPPI	BILOXI	543	519
MISSISSIPPI	GULFPORT	489	468
MISSISSIPPI	JACKSON	2895	2768
MISSISSIPPI	MOSS POINT	284	272
MISSISSIPPI	PASCAGOULA	311	297
MISSOURI	COLUMBIA	618	591
MISSOURI	FLORISSANT	285	273
MISSOURI	INDEPENDENCE	725	693
MISSOURI	JOPLIN	670	641
MISSOURI	KANSAS CITY	8483	8112
MISSOURI	ST CHARLES	245	234
MISSOURI	ST JOSEPH	1670	1597
MISSOURI	ST LOUIS	20302	19413
MISSOURI	SPRINGFIELD	1324	1266
MISSOURI	ST LOUIS COUNTY	5060	4839
MONTANA	BILLINGS	589	563
MONTANA	GREAT FALLS	683	653
NEBRASKA	LINCOLN	1351	1292
NEBRASKA	OMAHA	3691	3529
NEVADA	LAS VEGAS	1837	1757
NEVADA	NORTH LAS VEGAS	637	609
NEVADA	RENO	880	841
NEVADA	SPARKS	317	303
NEVADA	CLARK COUNTY	2268	2169
NEW HAMPSHIRE	DOVER	271	259
NEW HAMPSHIRE	MANCHESTER	1504	1438
NEW HAMPSHIRE	NASHUA	561	536
NEW HAMPSHIRE	PORTSMOUTH	450	430
NEW HAMPSHIRE	ROCHESTER	235	225
NEW JERSEY	ASBURY PARK	420	402
NEW JERSEY	ATLANTIC CITY	1707	1632
NEW JERSEY	BAYONNE	1692	1618

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
NEW JERSEY	BLOOMFIELD	1006	962
NEW JERSEY	BRICK TOWNSHIP	352	337
NEW JERSEY	BRIDGETON	470	449
NEW JERSEY	CAMDEN	3029	2896
NEW JERSEY	CHERRY HILL	311	297
NEW JERSEY	CLIFTON	1269	1213
NEW JERSEY	DOVER TOWNSHIP	397	380
NEW JERSEY	EAST ORANGE	1479	1414
NEW JERSEY	EDISON	385	368
NEW JERSEY	ELIZABETH	2163	2068
NEW JERSEY	GLOUCESTER TWP	275	263
NEW JERSEY	HAMILTON	498	476
NEW JERSEY	IRVINGTON	1108	1060
NEW JERSEY	JERSEY CITY	6812	6514
NEW JERSEY	LONG BRANCH	499	477
NEW JERSEY	MIDDLETOWN	324	310
NEW JERSEY	MILLVILLE	281	269
NEW JERSEY	NEWARK	9922	9488
NEW JERSEY	NEW BRUNSWICK	830	794
NEW JERSEY	OLD BRIDGE TOWNSHIP	319	305
NEW JERSEY	PARSIPPANY-TROYHILLS	220	210
NEW JERSEY	PASSAIC	1266	1211
NEW JERSEY	PATERSON	3187	3048
NEW JERSEY	PERTH AMBOY	838	801
NEW JERSEY	SAYREVILLE	156	149
NEW JERSEY	TRENTON	2859	2734
NEW JERSEY	UNION CITY	1337	1278
NEW JERSEY	UNION	605	579
NEW JERSEY	VINELAND	590	564
NEW JERSEY	WAYNE TOWNSHIP	198	189
NEW JERSEY	WOODBRIDGE	446	426
NEW JERSEY	BERGEN COUNTY	8964	8572
NEW JERSEY	BURLINGTON COUNTY	2204	2108
NEW JERSEY	CAMDEN COUNTY	1816	1737
NEW JERSEY	ESSEX COUNTY	4824	4613
NEW JERSEY	GLOUCESTER COUNTY	1532	1465
NEW JERSEY	HUDSON COUNTY	4603	4402
NEW JERSEY	MIDDLESEX COUNTY	1580	1511
NEW JERSEY	MONMOUTH COUNTY	2626	2511
NEW JERSEY	MORRIS COUNTY	1725	1650
NEW JERSEY	OCEAN COUNTY	1871	1789
NEW JERSEY	SOMERSET COUNTY	1224	1170
NEW JERSEY	UNION COUNTY	4385	4193
NEW MEXICO	ALBUQUERQUE	3565	3409
NEW MEXICO	LAS CRUCES	722	690
NEW MEXICO	SANTA FE	600	574
NEW YORK	ALBANY	3414	3265
NEW YORK	AMHERST TOWN	518	495
NEW YORK	BABYLON TOWN	1420	1358
NEW YORK	BINGHAMTON	2056	1966
NEW YORK	BUFFALO	15514	14835
NEW YORK	CHEEKTOWAGA TOWN	627	600
NEW YORK	CLAY TOWN	283	271
NEW YORK	COLONIE TOWN	407	389
NEW YORK	DUNKIRK	452	432
NEW YORK	ELMIRA	1223	1169
NEW YORK	GLEN FALLS	454	434
NEW YORK	GREECE	371	355
NEW YORK	HAMBURG TOWN	327	313
NEW YORK	HUNTINGTON TOWN	909	869
NEW YORK	IRONDEQUOIT	664	635

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
NEW YORK	ISLIP TOWN	2111	2019
NEW YORK	JAMESTOWN	1147	1097
NEW YORK	MIDDLETOWN	458	438
NEW YORK	MOUNT VERNON	1654	1582
NEW YORK	NEWBURGH	796	761
NEW YORK	NEW ROCHELLE	1416	1354
NEW YORK	NEW YORK	164732	157523
NEW YORK	NIAGARA FALLS	2421	2315
NEW YORK	POUGHKEEPSIE	930	889
NEW YORK	ROCHESTER	8087	7733
NEW YORK	ROME	941	900
NEW YORK	SCHENECTADY	2151	2057
NEW YORK	SYRACUSE	5524	5282
NEW YORK	TONAWANDA TOWN	1532	1465
NEW YORK	TROY	1784	1706
NEW YORK	UNION TOWN	1154	1103
NEW YORK	UTICA	2686	2568
NEW YORK	WEST SENECA	242	231
NEW YORK	WHITE PLAINS	908	868
NEW YORK	YONKERS	3298	3154
NEW YORK	DUTCHESS COUNTY	1256	1201
NEW YORK	ERIE COUNTY	2156	2062
NEW YORK	MONROE COUNTY	1598	1528
NEW YORK	NASSAU COUNTY	11478	10976
NEW YORK	ONONDAGA COUNTY	1545	1477
NEW YORK	ORANGE COUNTY	1533	1466
NEW YORK	ROCKLAND COUNTY	1525	1458
NEW YORK	SUFFOLK COUNTY	3636	3477
NEW YORK	WESTCHESTER COUNTY	4451	4256
NORTH CAROLINA	ASHEVILLE	975	932
NORTH CAROLINA	BURLINGTON	354	339
NORTH CAROLINA	CHAPEL HILL	285	273
NORTH CAROLINA	CHARLOTTE	3335	3189
NORTH CAROLINA	CONCORD	262	251
NORTH CAROLINA	DURHAM	1376	1316
NORTH CAROLINA	FAYETTEVILLE	915	875
NORTH CAROLINA	GASTONIA	579	554
NORTH CAROLINA	GREENSBORO	1627	1556
NORTH CAROLINA	HICKORY	239	229
NORTH CAROLINA	HIGH POINT	707	676
NORTH CAROLINA	JACKSONVILLE	259	248
NORTH CAROLINA	KANNAPOLIS	435	416
NORTH CAROLINA	RALEIGH	1456	1392
NORTH CAROLINA	SALISBURY	276	264
NORTH CAROLINA	WILMINGTON	718	687
NORTH CAROLINA	WINSTON SALEM	1595	1525
NORTH DAKOTA	BISMARCK	286	273
NORTH DAKOTA	FARGO	519	496
NORTH DAKOTA	GRAND FORKS	370	354
OHIO	AKRON	6079	5813
OHIO	BARBERTON	641	613
OHIO	BOWLING GREEN	288	275
OHIO	CANTON	2610	2496
OHIO	CINCINNATI	11590	11083
OHIO	CLEVELAND	22690	21697
OHIO	CLEVELAND HEIGHTS	1309	1252
OHIO	COLUMBUS	6239	5966
OHIO	DAYTON	6014	5751
OHIO	EAST CLEVELAND	872	834
OHIO	ELYRIA	481	460
OHIO	EUCLID	786	752
OHIO	HAMILTON CITY	1273	1217

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
OHIO	KENT	292	279
OHIO	KETTERING	292	279
OHIO	LAKEWOOD	1600	1530
OHIO	LANCASTER	420	402
OHIO	LIMA	1061	1015
OHIO	LORAIN	962	920
OHIO	MANSFIELD	777	743
OHIO	MARIETTA	363	347
OHIO	MASSILLON	545	521
OHIO	MIDDLETOWN	519	496
OHIO	NEWARK	746	713
OHIO	PARMA	513	491
OHIO	SPRINGFIELD	1816	1737
OHIO	STEUBENVILLE	747	714
OHIO	TOLEDO	6230	5957
OHIO	WARREN	1126	1077
OHIO	YOUNGSTOWN	4070	3892
OHIO	CUYAHOGA COUNTY	2689	2571
OHIO	FRANKLIN COUNTY	1795	1716
OHIO	HAMILTON COUNTY	2754	2633
OHIO	LAKE COUNTY	1074	1027
OHIO	MONTGOMERY COUNTY	1990	1903
OHIO	STARK COUNTY	1484	1419
OHIO	SUMMIT COUNTY	1311	1254
OKLAHOMA	BROKEN ARROW	234	224
OKLAHOMA	EDMOND	261	250
OKLAHOMA	ENID	383	366
OKLAHOMA	LAWTON	965	923
OKLAHOMA	MIDWEST CITY	392	375
OKLAHOMA	NORMAN	617	590
OKLAHOMA	OKLAHOMA CITY	4051	3874
OKLAHOMA	SHAWNEE	416	398
OKLAHOMA	TULSA	3096	2961
OREGON	EUGENE	1037	992
OREGON	GRESHAM	362	346
OREGON	MEDFORD	376	360
OREGON	PORTLAND	6767	6471
OREGON	SALEM	776	742
OREGON	SPRINGFIELD	444	425
OREGON	CLACKAMAS COUNTY	1581	1512
OREGON	MULTNOMAH COUNTY	591	565
OREGON	WASHINGTON COUNTY	1615	1544
PENNSYLVANIA	ABINGTON	569	544
PENNSYLVANIA	ALLENTOWN	2236	2138
PENNSYLVANIA	ALTOONA	1768	1691
PENNSYLVANIA	BENSALEM TOWNSHIP	405	387
PENNSYLVANIA	BETHLEHEM	1291	1235
PENNSYLVANIA	BRISTOL TWP	459	439
PENNSYLVANIA	CARLISLE	272	260
PENNSYLVANIA	CHESTER	1574	1505
PENNSYLVANIA	EASTON	772	738
PENNSYLVANIA	ERIE	3012	2880
PENNSYLVANIA	HARRISBURG	2129	2036
PENNSYLVANIA	HAVERFORD	764	731
PENNSYLVANIA	HAZLETON	813	777
PENNSYLVANIA	JOHNSTOWN	1529	1462
PENNSYLVANIA	LANCASTER	1417	1355
PENNSYLVANIA	LEBANON	707	676
PENNSYLVANIA	LOWER MERION	884	845
PENNSYLVANIA	MCKEESPORT	1212	1159
PENNSYLVANIA	NORRISTOWN	817	781
PENNSYLVANIA	PENN HILLS	423	404

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
PENNSYLVANIA	PHILADELPHIA	48564	46439
PENNSYLVANIA	PITTSBURGH	15870	15175
PENNSYLVANIA	READING	2743	2623
PENNSYLVANIA	SCRANTON	2989	2858
PENNSYLVANIA	SHARON	656	627
PENNSYLVANIA	STATE COLLEGE	558	534
PENNSYLVANIA	UPPER DARBY	1617	1546
PENNSYLVANIA	WILKES-BARRE	1710	1635
PENNSYLVANIA	WILLIAMSPORT	1128	1079
PENNSYLVANIA	YORK	1418	1356
PENNSYLVANIA	ALLEGHENY COUNTY	13087	12514
PENNSYLVANIA	BEAVER COUNTY	3201	3061
PENNSYLVANIA	BERKS COUNTY	2209	2112
PENNSYLVANIA	BUCKS COUNTY	2137	2043
PENNSYLVANIA	CHESTER COUNTY	2300	2199
PENNSYLVANIA	DELAWARE COUNTY	3005	2873
PENNSYLVANIA	LANCASTER COUNTY	2701	2583
PENNSYLVANIA	LUZERNE COUNTY	4185	4002
PENNSYLVANIA	MONTGOMERY COUNTY	2935	2807
PENNSYLVANIA	WASHINGTON COUNTY	3789	3623
PENNSYLVANIA	WESTMORELAND COUNTY	3263	3120
PENNSYLVANIA	YORK COUNTY	2125	2032
RHODE ISLAND	CRANSTON	829	793
RHODE ISLAND	EAST PROVIDENCE	532	509
RHODE ISLAND	PAWTUCKET	1688	1614
RHODE ISLAND	PROVIDENCE	5379	5144
RHODE ISLAND	WARWICK	607	580
RHODE ISLAND	WOONSOCKET	1049	1003
SOUTH CAROLINA	ANDERSON	745	712
SOUTH CAROLINA	CHARLESTON	1125	1076
SOUTH CAROLINA	COLUMBIA	1327	1269
SOUTH CAROLINA	FLORENCE	445	426
SOUTH CAROLINA	GREENVILLE	1011	967
SOUTH CAROLINA	NORTH CHARLESTON	799	764
SOUTH CAROLINA	ROCK HILL	437	418
SOUTH CAROLINA	SPARTANBURG	634	606
SOUTH CAROLINA	GREENVILLE COUNTY	2162	2067
SOUTH DAKOTA	RAPID CITY	466	446
SOUTH DAKOTA	SIOUX FALLS	647	619
TENNESSEE	BRISTOL	232	222
TENNESSEE	CHATTANOOGA	2142	2048
TENNESSEE	CLARKSVILLE	587	561
TENNESSEE	JACKSON	624	597
TENNESSEE	JOHNSON CITY	466	446
TENNESSEE	KINGSPORT	322	308
TENNESSEE	KNOXVILLE	2163	2068
TENNESSEE	MEMPHIS	10101	9659
TENNESSEE	MURFREESBORO	378	361
TENNESSEE	NASHVILLE-DAVIDSON	4674	4469
TENNESSEE	OAK RIDGE	198	189
TENNESSEE	KNOX COUNTY	1104	1056
TEXAS	ABILENE	1020	975
TEXAS	AMARILLO	1426	1364
TEXAS	ARLINGTON	1257	1202
TEXAS	AUSTIN	4676	4471
TEXAS	BAYTOWN CITY	629	601
TEXAS	BEAUMONT	1598	1528
TEXAS	BROWNSVILLE	2447	2340
TEXAS	BRYAN	689	659
TEXAS	CARROLLTON	275	263

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
TEXAS	COLLEGE STATION	601	575
TEXAS	CORPUS CHRISTI	3455	3304
TEXAS	DALLAS	11691	11179
TEXAS	DENISON	316	302
TEXAS	DENTON	511	489
TEXAS	EDINBURG	649	621
TEXAS	EL PASO	7702	7365
TEXAS	FORT WORTH	4723	4516
TEXAS	GALVESTON	1304	1247
TEXAS	GARLAND	1029	984
TEXAS	GRAND PRAIRIE	755	722
TEXAS	HARLINGEN	975	932
TEXAS	HOUSTON	20385	19493
TEXAS	IRVING	857	819
TEXAS	KILLEEN	738	706
TEXAS	LAREDO	2764	2643
TEXAS	LONGVIEW	657	628
TEXAS	LUBBOCK	2177	2082
TEXAS	MC ALLEN	1552	1484
TEXAS	MARSHALL	378	361
TEXAS	MESQUITE	506	484
TEXAS	MIDLAND	744	711
TEXAS	MISSION	630	602
TEXAS	ODESSA	1063	1016
TEXAS	ORANGE	325	311
TEXAS	PASADENA	1087	1039
TEXAS	PLANO	470	449
TEXAS	PORT ARTHUR	1313	1256
TEXAS	RICHARDSON C	327	313
TEXAS	SAN ANGELO	876	838
TEXAS	SAN ANTONIO	13807	13203
TEXAS	SAN BENITO	478	457
TEXAS	SHERMAN	245	234
TEXAS	TEMPLE	497	475
TEXAS	TEXARKANA	457	437
TEXAS	TEXAS CITY	401	383
TEXAS	TYLER	774	740
TEXAS	VICTORIA	674	645
TEXAS	WACO	1453	1389
TEXAS	WICHITA FALLS	1245	1191
TEXAS	BEXAR COUNTY	1577	1508
TEXAS	DALLAS COUNTY	1048	1002
TEXAS	HARRIS COUNTY	4958	4741
TEXAS	HIDALGO COUNTY	5617	5371
TEXAS	TARRANT COUNTY	2244	2146
UTAH	OGDEN	1083	1036
UTAH	OREM	568	543
UTAH	PROVO	1415	1353
UTAH	SALT LAKE CITY	3867	3698
UTAH	SANDY CITY	415	397
UTAH	WEST VALLEY	670	641
UTAH	SALT LAKE COUNTY	2666	2549
VERMONT	BURLINGTON	684	654
VIRGINIA	ALEXANDRIA	903	863
VIRGINIA	BRISTOL	265	253
VIRGINIA	CHARLOTTESVILLE	535	512
VIRGINIA	CHESAPEAKE	1128	1079
VIRGINIA	COLONIAL HEIGHTS	86	82
VIRGINIA	DANVILLE	652	623
VIRGINIA	HAMPTON	1115	1066
VIRGINIA	HOPEWELL	223	213

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
VIRGINIA	LYNCHBURG	655	626
VIRGINIA	NEWPORT NEWS	1492	1427
VIRGINIA	NORFOLK	4184	4001
VIRGINIA	PETERSBURG	602	576
VIRGINIA	PORTSMOUTH	1608	1538
VIRGINIA	RICHMOND	3969	3795
VIRGINIA	ROANOKE	1579	1510
VIRGINIA	SUFFOLK	637	609
VIRGINIA	VIRGINIA BEACH	2131	2038
VIRGINIA	ARLINGTON COUNTY	1909	1825
VIRGINIA	FAIRFAX COUNTY	3518	3364
VIRGINIA	HENRICO COUNTY	1152	1102
WASHINGTON	AUBURN	232	222
WASHINGTON	BELLEVUE	405	387
WASHINGTON	BELLINGHAM	590	564
WASHINGTON	BREMERTON	337	322
WASHINGTON	EVERETT	608	581
WASHINGTON	KENNEWICK	315	301
WASHINGTON	OLYMPIA	259	248
WASHINGTON	PASCO	281	269
WASHINGTON	RICHLAND	185	177
WASHINGTON	SEATTLE	10402	9947
WASHINGTON	SPOKANE	3308	3163
WASHINGTON	TACOMA	2317	2216
WASHINGTON	YAKIMA	622	595
WASHINGTON	CLARK COUNTY	1574	1505
WASHINGTON	KING COUNTY	4307	4119
WASHINGTON	PIERCE COUNTY	2643	2527
WASHINGTON	SNOHOMISH COUNTY	2011	1923
WASHINGTON	SPOKANE COUNTY	1300	1243
WEST VIRGINIA	CHARLESTON	1851	1770
WEST VIRGINIA	HUNTINGTON	1987	1900
WEST VIRGINIA	PARKERSBURG	928	887
WEST VIRGINIA	WEIRTON	418	400
WEST VIRGINIA	WHEELING	1352	1293
WISCONSIN	APPLETON	489	468
WISCONSIN	BELOIT	567	542
WISCONSIN	EAU CLAIRE	555	531
WISCONSIN	GREEN BAY	773	739
WISCONSIN	JANESVILLE	427	408
WISCONSIN	KENOSHA	931	890
WISCONSIN	LA CROSSE	888	849
WISCONSIN	MADISON	1572	1503
WISCONSIN	MILWAUKEE	14681	14038
WISCONSIN	NEENAH	179	171
WISCONSIN	OSHKOSH	718	687
WISCONSIN	RACINE	1592	1522
WISCONSIN	SHEBOYGAN	790	755
WISCONSIN	SUPERIOR	773	739
WISCONSIN	WAUKESHA	319	305
WISCONSIN	WAUSAU	534	511
WISCONSIN	WAUWATOSA	866	828
WISCONSIN	WEST ALLIS	1015	971
WISCONSIN	MILWAUKEE COUNTY	1105	1057
WISCONSIN	WAUKESHA COUNTY	832	796
WYOMING	CASPER	395	378
WYOMING	CHEYENNE	351	336
PUERTO RICO	TOA BAJA MUNICIPIO	2583	2470
PUERTO RICO	AGUADILLA MUNICIPIO	2131	2038
PUERTO RICO	ARECIBO MUNICIPIO	3382	3234
PUERTO RICO	BAYAMAON MUNICIPIO	5462	5223
PUERTO RICO	CAGUAS MUNICIPIO	3983	3809

CDBG ESTIMATED FY 1990 AND FY 1991
FOR ENTITLEMENT CITIES AND URBAN COUNTIES
(AMOUNTS IN THOUSANDS OF DOLLARS)

STATE	ENTITLED PLACE	EST FY 90	EST FY 91
PUERTO RICO	CAROLINA MUNICIPIO	4520	4322
PUERTO RICO	FAJARDO MUNICIPIO	1183	1131
PUERTO RICO	GUAYNABO MUNICIPIO	2194	2098
PUERTO RICO	HUMACAO MUNICIPIO	1838	1758
PUERTO RICO	MAYAGUEZ MUNICIPIO	3282	3138
PUERTO RICO	PONCE MUNICIPIO	7090	6780
PUERTO RICO	SAN JUAN MUNICIPIO	12357	11816
PUERTO RICO	TRUJILLO ALTO MUN	1612	1541
** Total ***		1972254	1885936

Section Loan Guarantee Program

SENATOR KERREY: How many communities currently have Section 108 loans?

ANSWER: Our records indicate that 175 communities have loans with an unpaid balance or have recently received commitments which are expected to be used.

SENATOR KERREY: Do you have any way of knowing how many additional communities have been planning to utilize such loans?

ANSWER: We have no way of knowing precisely how many additional communities are planning to submit applications. However, our analysis of the trend in applications submitted during fiscal years 1987-1989 indicates that between 35 and 40 additional communities can be expected to submit applications this fiscal year.

Community Development Block Grants

SENATOR KERRY: Revenue sharing is no longer available, UDAG is gone, CDBG is static if not shrinking and subject to growing limitations. What do you say to cities about community and economic development? Is it no longer a priority at HUD?

ANSWER: Community and economic development remain a priority for the Department. Through Enterprise Zones, an important part of the HOPE initiative, communities will be able to create jobs and promote economic development. Additionally, communities will be able to continue to use Community Development Block Grants as a tool to leverage private investment in economic development projects.

ASSISTED HOUSING

SENATOR KERREY: Are you confident that you have budgeted sufficiently this year for expiring Section 8 Contracts?

ANSWER: The $7.7 billion estimate for 1991 is based on the best information that we have.

SECTION 202

SENATOR KERREY: Several elderly groups have suggested that Section 202 is no longer really used to assist the elderly; instead, they say, the emphasis is on the physically and mentally handicapped; and that therefore the whole nature of the program has changed.

Since an increasingly number of the elderly are finding themselves in some type of assisted housing, do you believe this change is a good one? What response do you have for the elderly who think a program designed to benefit them is being undermined?

ANSWER: The Department has no "preference" between the elderly or the handicapped. It is equally committed to assisting both segments of the population within the framework of the resources available and the limitations imposed by legislation. Twenty-five percent of the loan authority is required by Appropriations Act language to be used primarily for housing for the nonelderly handicapped. This is a separate program under Section 202. Traditionally, 10 percent of all units in housing for the elderly are designed for persons needing accessible units. Occupancy in these units has been limited to persons who were mobility impaired - elderly as well as individuals between the ages of 18 and 62.

Since passage of Section 504 of the Rehabilitation Act of 1963 which prohibits discrimination against the handicapped and the Fair Housing Amendments, it is unclear whether there can be "elderly only" projects. The Section 202 statute provides for eligibility of elderly or handicapped. Further, it is unclear whether occupancy by handicapped persons under age 62 can be limited to persons needing an accessible unit or whether persons who are chronically mentally ill or mentally retarded also are eligible for assistance.

HUD's policy is that sponsors may not admit handicapped persons other than those needing accessible units without application by the sponsor to HUD to serve another population, i.e., the mentally retarded. The sponsor is initially funded based, in part, on specific experience with the elderly, and since specialized skills and services are required to serve the mentally retarded (or other handicapped populations), such persons were not automatically eligible to live in a project for the elderly.

The Department receives constant requests to allow occupancy by all types of handicapped persons in projects developed as housing for the elderly. In some instances, such substantial numbers of handicapped persons have been admitted that the character of a project - if not the program, has changed.

CONGREGATE SERVICES

SENATOR KERREY: What is your justification for no budget request for congregate housing?

ANSWER: The Administation has proposed to build on the experience of the CHSP through a new initiative under the HOPE program which would establish a demonstration project to provide service-supported housing for the frail elderly. The demonstration would couple housing vouchers with assistance to help pay for the services they would need in order to continue living independently. HUD will provide $34 million in housing voucher assistance and $10 million in supportive services funding. Both kinds of assistance will be for 5 years. Approximately, 1,500 frail elderly individuals will be served under this demonstration. This approach to housing the elderly will be used to test whether services provided within a variety of alternative housing situations will prove more effective than the Congregate Housing Services Program. After 1991, however, it is imperative that we work to ensure effective coordination between HUD projects and HHS agencies.

It is apparent, from visiting with and talking to many service providers, particularly those in urban areas, that there are sufficient State and local resources available to provide for the supportive service needs of the frail elderly. The problem now (as in 1978 when the CHSP was initially funded), is that the linkage is inadequate between HUD, HHS and other agencies providing services.

Thus, in order to provide for the service needs of the 2,000 residents serviced by the CHSP and the needs of the other 1,500,000 elderly in Federally assisted housing, we are developing this initiative to focus on better targeting of the HHS supportive service funds to the frail elderly of HUD housing, while also providing HUD staff and project managers with the skills they need to deal with the aging in place phenomenon. We recognize that while it may be fairly easy to accomplish this with assistance from the Administration on Aging (AoA) and others in urban areas, we will have to work closely with the States to ensure there is no loss of needed services in rural projects.

Secretaries Kemp and Sullivan of HHS signed a Memorandum of Understanding (MOU) on January 24, 1990, in which they agreed to work together more closely to assure that services from HHS are better targeted to identified HUD client populations. A number of staff-level groups are currently working to insure that activities are developed to benefit those populations. Additionally, in order to better meet the needs of the elderly under the aegis of this MOU, the Department is working with AoA to achieve similar goals for our frail elderly and non-elderly handicaped populations. We expect to finalize an interagency agreement shortly with AoA in which we will jointly do the following:

1. Require our Field Offices and AoA-sponsored Aging network staff to work together to develop State and local level coordination agreements to ensure that a higher level of available resources is targeted to those frail elderly in Federally assisted housing. This will be a three-Region demonstation in fiscal year 1991, we hope to expand this program to all Regions in fiscal year 1992.

2. Provide training and technical assistance to HUD staff and project managers on services coordination and aging in place.

3. Develop a handbook of supportive services and services management for the 1990's, and an up-dated directory of HUD housing for the elderly and handicapped.

4. Develop a policy defining "frail elderly" for HUD allowing service coordinators as an eligible expense in HUD projects.

5. Hold a series of national and regional conferences on aging in place and the frail elderly in HUD projects.

6. Determine retrofitting needs and costs for HUD projects in the 1990's to meet the needs of the frail elderly.

7. Also, we hope to begin working with the National Institute of Mental Health and other agencies to expand these activities to address the needs of the chronically mentally ill population.

Thus, we believe these activities should go a long way to insure the improvement of services to the frail residents of HUD housing, and also, continuance of services to the CHSP grantees.

LOW- AND MODERATE INCOME HOUSING ASSISTANCE

SENATOR KERREY: We have several communities in Nebraska which are likely to see an influx of people due to economic development (company relocation or expansion). What types of low- and moderate income housing assistance are available to assist communities such as these where a large number of people are likely to come in from farm areas and very small communities?

What these communities need is reasonably priced rental property. Is there any support or any gap financing available either for the cities or for individual builders?

ANSWER: HUD can provide mortgage insurance to assist in financing new construction and rehabilitation of rental housing under Sections 221(d)(3) and 221(d)(4) of the National Housing Act. The Department insures loans made by private lenders. These loans may be for up to 40 years, are non-recourse and are subject to underwriting requirements to assure that project incomes will support operation and debt service. Through this mortgage insurance program, HUD can insure up to 90 percent of a project's replacement cost fron profit-motivated mortgagors or up to 100 percent of replacement cost non-profit mortgagors. However, there are no interest rate or rental subsidies included in the 221(d) program.

Rental housing assistance also is available for eligible families under Section 8 existing Certificate and Voucher program operated by local Public Housing Agencies. The Section 221(d) program could be used (in conjunction with Section 8 rental assistance to families) as a financing vehicle for these projects if all underwriting standards and requirements are met.

HUD-HHS AGREEMENT TO COORDINATE SERVICES

SENATOR KERREY: Please explain the substance of the HUD-HHS agreement. In what way can this co-operation help insure that the multitude of services which many people in Public Housing often need can be made available?

ANSWER: The agreement between the Departments of Housing and Urban Development (HUD) and Health and Human Service (HHS) is designed to facilitate the coordination and integration of the respective housing, health, support service and income assistance programs administered by these respective agencies. The goal is to develop systems that integrate housing, income assistance, health, and other support services. Federal funds will be used to promote cooperation and coordination among State and local housing, health, income assistance, and human services providers and administrators, and non-profit and community organizations.

Each Department also will implement new approaches to help families and individuals served by social welfare and housing programs and help in developing systematic mechanisms at the Federal, State and community levels to coordinate and integrate housing, health, support service and income assistance programs. Under the HUD-HHS agreement, such mechanisms can be created to coordinate and integrate the many services needed by residents of Public Housing. One example of this will be to coordinate the operations of the Head Start program administered by HHS and the Public Housing Child Care Demonstration administered by HUD to increase the number of Head Start programs located at or near Public Housing sites as well as to expand the Head Start hours to better serve the needs of Public Housing residents to obtain, retain or train for employment.

The agreement between the Secretaries of HHS and HUD also recognizes that cooperative initiatives between these two Departments can better achieve the Administration's goals to empower the poor to control their lives and assist them with opportunities to end the tragedy of homelessness. Therefore, under the agreement, HUD and HHS will undertake a series of joint activities to focus resources effectively.

Because of the urgency of the needs, the first of the joint activities will focus on three of the most vulnerable groups among the poor--welfare families in both Public Housing and Assisted Housing, homeless families with children, and the seriously mentally ill homeless. The purpose of the activities will be to provide these low-income families and individuals with opportunities for employment, self-sufficiency and homeownership. Another goal will be to reduce the number of homeless in the streets by providing emergency shelters and by strengthening and improving the safety net of needs-based housing and human services assistance.

FY 1991 TOTAL OPERATING SUBSIDY REQUIREMENTS

SENATOR KERREY: What is your current estimate of what it would cost to fully fund Public Housing operating subsidies in fiscal 1991?

ANSWER: The Department's current estimate of Public Housing operating subsidy requirements for fiscal year 1991 is $1,825.7 million, the amount requested in the President's Budget for 1991.

INCREASE IN RESEARCH AND TECHNOLOGY

SENATOR KERREY: You requested a major increase in Research and Technology. What would these funds be used for?

ANSWER: In addition to a slight increase for regular, ongoing research activities, there is a request for a transfer of $25 million from other HUD accounts to Research and Technology for increased evaluation and monitoring of HUD activities. The proposal is a key element in the Department's Reform package to correct the serious problems which surfaced last year. HUD devotes insufficient attention to find out what is happening in its programs. The most costly problems have come in programs which have gone awry because mismanagement or poor program design have not been detected.

The monitoring aspect would help program managers and departmental management know what is happening currently with HUD programs and would detect problems at an early stage. The evaluations would be both short term, highly focused studies and longer term analyses.

There are four substantive areas with a need for improved evaluation and monitoring. People - HUD lacks program data such as the income, age, sex, race, and household composition of the 4.5 million households receiving housing assistance. The absence of usable information about Section 8 tenants has been identified to the Congress as one of the Department's major material weaknesses. Projects - HUD has very little program data about our subsidized housing projects, for example, their precise locations or their financial and physical characteristics. Community Development - The $3 billion CDBG program has very little information collected except the amount of money awarded to grantees. In addition to information already collected on how much money is spent, we would like to keep track of how the money is spent, i.e. the number of businesses and jobs created, the number of units rehabilitated, and the miles of road and sewer lines built. Administrative Improvements - Our program officers would be able to manage their programs more efficiently. For example, PHAs with potential problems would be monitored more frequently than other PHAs. Also, new data collection procedures would permit CDBG grantees to submit their annual grantee performance reports in machine readable format with built-in consistency checks.

QUESTIONS SUBMITTED BY SENATOR D'AMATO

SECTION 202 PIPELINE

SENATOR D'AMATO: It is clear even with conservative estimates of 26,000 units that there is a backlog (i.e., pipeline) of projects in this program. Exactly how many units/projects has HUD awarded under the 202 program that have not currently begun construction? Nationwide? By state? By year?

ANSWER: The tables below present the Section 202 pipeline of projects/units which were funded but have not begun construction as of April 30, 1990. The data are distributed by year of funding and location. The 9,173 units receiving funding reservations in 1989 have been excluded from the tabulation. These reservations occurred very late in the year. With little or no chance of beginning construction by April 1990, inclusion of these units in the tables may tend to distort the construction pipeline picture.

SECTION 202 PIPELINE
(AS OF APRIL 30, 1990)

REGION 1:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
RHODE ISLAND	1	1985	55
	3	1986	77
	3	1987	78
CONNECTICUT	1	1986	40
	1	1987	12
	4	1988	147
MASSACHUSETTS	1	1984	60
	3	1985	194
	3	1986	120
	7	1987	194
	10	1988	227
MAINE	1	1984	20
	1	1986	30
	1	1987	14
	3	1988	59
NEW HAMPSHIRE	1	1986	20
	3	1988	33
VERMONT	1	1988	10

REGIONAL TOTALS: PROJECTS 48
UNITS 1390

REGION 2:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
NEW YORK	1	1983	40
	3	1984	185
	5	1985	242
	10	1986	681
	19	1987	1185
	30	1988	1523
NEW JERSEY	3	1985	116
	6	1986	214

PUERTO RICO	2	1985	110
	3	1986	179
	6	1987	297
	4	1988	100

REGIONAL TOTALS: PROJECTS 92
UNITS 4872

REGION 3:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
MARYLAND	1	1984	60
	1	1985	20
	2	1986	85
	5	1987	246
	6	1988	119
DC	1	1986	84
	1	1987	96
	1	1988	40
VIRGINIA	1	1985	12
	1	1986	38
	4	1987	107
	10	1988	229
DELAWARE	1	1986	50
	1	1987	16
	2	1988	76
PENNSYLVANIA	2	1984	101
	3	1985	99
	5	1986	283
	4	1987	190
	11	1988	337
WEST VIRGINIA	1	1986	24
	3	1987	78
	4	1988	87

REGIONAL TOTALS: PROJECTS 71
UNITS 2477

REGION 4:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
NORTH CAROLINA	2	1987	14
	8	1988	135
SOUTH CAROLINA	1	1986	20
	7	1987	308
	7	1988	176
GEORGIA	1	1985	12
	4	1986	176
	3	1987	121
	11	1988	237
ALABAMA	3	1987	65
	10	1988	212
FLORIDA	6	1986	164
	13	1987	336
	14	1988	568
MISSISSIPPI	1	1985	36
	1	1986	16
	4	1987	111
	7	1988	256
TENNESSEE	3	1985	31
	8	1987	121
	11	1988	209

REGIONAL TOTALS: PROJECTS 125
UNITS 3324

REGION 5:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
OHIO	2	1985	50
	3	1986	93
	8	1987	208
	20	1988	303
MICHIGAN	1	1984	122
	1	1986	19
	5	1987	140
	10	1988	348
ILLINOIS	2	1984	46
	6	1985	141
	8	1986	473
	17	1988	629

INDIANA	1	1986	50
	3	1987	94
	4	1988	126
WISCONSIN	11	1988	213
MINNESOTA	1	1987	15
	8	1988	151

REGIONAL TOTALS: PROJECTS 111
UNITS 3221

REGION 6:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
LOUISIANA	1	1985	29
	4	1986	185
	5	1987	231
	2	1988	102
ARKANSAS	3	1987	33
	9	1988	160
TEXAS	2	1985	100
	5	1986	194
	6	1987	236
	10	1988	397
NEW MEXICO	3	1986	54
	1	1987	40
	3	1988	92
OKLAHOMA	1	1986	25
	3	1987	77
	5	1988	143

REGIONAL TOTALS: PROJECTS 63
UNITS 2098

REGION 7:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
IOWA	1	1987	30
	7	1988	192
MISSOURI	4	1987	64
	9	1988	159
KANSAS CITY	7	1988	119

NEBRASKA	4	1988	105

REGIONAL TOTALS: PROJECTS 32
UNITS 669

REGION 8:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
SOUTH DAKOTA	1	1988	26
COLORADO	1	1986	50
	1	1987	50
	7	1988	183
WYOMING	1	1986	40

REGIONAL TOTALS: PROJECTS 11
UNITS 349

REGION 9:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
CALIFORNIA	1	1984	40
	1	1985	41
	7	1986	366
	16	1987	679
	23	1988	818
NEVADA	1	1985	28
	1	1986	28
	1	1988	30
ARIZONA	1	1986	46
	1	1987	84
	3	1988	91
HAWAII	1	1987	5
	4	1988	113

REGIONAL TOTALS: PROJECTS 61
UNITS 2369

REGION 10:

STATES	NUMBER OF PROJECTS	FUNDING YEAR	UNITS
IDAHO	1	1988	11
OREGON	1	1986	30
	1	1987	5
	2	1988	40
WASHINGTON	2	1986	24
	1	1987	16
	8	1988	150

REGIONAL TOTALS:		
	PROJECTS	16
	UNITS	276

NATIONAL TOTALS
(AS OF APRIL 30, 1990)

FISCAL YEARS	PROJECTS	UNITS
1983	1	40
1984	12	634
1985	37	1316
1986	91	3978
1987	156	5596
1988	333	9841
TOTALS:	630	21045

SENATOR D'AMATO: Why have the projects not begun construction?

ANSWER: The major problems have been the capping of the FMRs and holding the older projects to the fiscal year 1986 rents. Those two things coupled with the 9 1/4 percent interest rate have created the need for large up-front cash requirements because the rents would not support the projected development cost. Authorization to use the current rents and the lower fiscal year 1990 interest rate are expected to be effective in helping to clear much of the backlog.

SENATOR D'AMATO: What do you believe needs to be done to maximize the use of this program?

ANSWER: We believe the recent changes made by the Department will maximize the use of this program. The changes include delegating a number of decisions to the Field and regional offices, permitting the use of the latest published Fair Market Rents, and most recently, in New York where high costs have caused problems with the Section 202 cost limits, we have indicated that Headquarters will consider waivers of the high cost limits on a case-by-case basis.

PUBLIC HOUSING DEVELOPMENT PIPELINE

SENATOR D'AMATO: It is estimated that there is a $3 billion backlog (i.e.-pipeline) in the Public Housing new construction program. What is the exact dollar amount/units? Why does it take HUD so long to award appropriated monies to PHAs?

ANSWER: At the start of fiscal year 1990, there were 27,356 units in the Public Housing preconstruction and construction pipelines representing an estimated $1.64 billion of budget authority--which is an average of $60,000 per unit based on a 3-bedroom row dwelling.

HUD reserves funds as quickly as possible once the appropriation is enacted and funds are apportioned to the Department. The amounts available for distribution must be calculated in accordance with statutory requirements and a Notice of Fund Availability (NOFA) must be published in the Federal Register. Following this stage, Public Housing Agencies (PHAs) submit applications by the established deadline. HUD then reviews and approves those PHA applications which are eligible to be funded within available funds and reserves the fiscal year funds for those projects that are selected prior to the end of the applicable fiscal year. Many PHAs request "front-end" Annual Contributions Contracts and limited funds are advanced shortly after fund reservation.

ELDERLY HOUSING

SENATOR D'AMATO: Please explain how the proposed 202 Elderly "leased existing units" program would work?

ANSWER: This would allow the nonprofit sponsor to lease units to rent to Section 8 eligible tenants, without having to purchase buildings to rehabilitate or land to construct a project.

The use of existing housing will provide more flexibility in housing type and location, promote integration of disabled people in the community by permitting scattered units, and make assistance available more quickly than in the development program.

For the elderly lease programs separate schedules are developed for newly constructed housing and for existing housing. Within these two major divisions, separate Fair Market Rents (FMRs) are set by bedroom size. For new construction, FMRs are established for five structured types: detached, semi-detached row, walk-up and elevator. The actual initial maximum monthly rent for an assisted unit cannot exceed the FMR established for a given area by more than 10 percent (20 percent under certain special conditions). Rents for a specific project also are judged on the basis of a "reasonableness test" which is designed to determine the rents which unassisted families would be willing and able to pay for similar units.

SENATOR D'AMATO: Who is involved in making this proposed program work?

ANSWER: The same staff which administers the new construction/rehab Section 202 program will be handling the implementation of the leasing program.

SENATOR D'AMATO: How does this proposed program benefit the elderly?

ANSWER: It would allow many to remain in their current apartments, provided the units meet certain housing quality standards. The housing would be available much more quickly, and particularly in areas where the market is overbuilt, assistance could be provided where new construction would not be justified.

SUBCOMMITTEE RECESS

Senator **Mikulski**. This subcommittee is now going to recess until Thursday, May 10, at 10 o'clock.

[Whereupon, at 4:29 o'clock p.m., Tuesday, May 8, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

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